ORDER NO. SD83042467C8

Service Manual

DIGITAL

Digital Audio Processor
SV-100

[E], [EK], [EG], [EB], [EH], [EF], [Ei], [XL], [XA]

Areas

* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [EG] is available in F.R. Germany.
* [EB] is available in Belgium.
* [EH] is available in Holland.
* [EF] is available in France.
* [Ei] is available in Italy.
* [XL] is available in Australia.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.

Specifications

Specifications are subject to change without notice for further improvement.
Weights and dimensions shown are approximate.

■ General

Power supply: 3-way power supply (operating voltage DC 12 V)
~110/120/220/240 V, 50/60 Hz (using supplied AC power unit SH-V100)
DC 12 V (using optional battery pack LCS-2012E)
DC 12 V (using optional car battey cord PV-C24)
(only for cars with negative grounded 12 V battery)

Power consumption: 14 W
(DC 12 V) (SV-100)
45 W (using SH-V100)
with SH-V100 power switch off: 1.3 W

Dimensions: SV-100: 24,4 W×25,1 D×9,5 H cm
SH-V100: 7,8 W×25,9 D×9,5 H cm

Weight: SV-100: 2.9 kg (6.46 lbs) (net)
SH-V100: 2.3 kg (5.1 lbs)

■ System type

Type: Digital audio processor

PCM standard: Consumer PCM encoder/decoder standards file STC-008 of the EIAJ stereo technical committee, video technical committee.
(with recording pre-emphasis)

Quantization: 14-bit linear

Coding: 14-bit linear

Recording time: maximum 2 hours (using NV-E120 VHS video cassette.)

Number of audio channels: 2 (L, R stereo)

Frequency response: 2 Hz~20 kHz (±0.5 dB)

Total harmonic distortion: 0.01% or less (1 kHz, 0 dB)

Dynamic range: 86 dB or more

■ Input level and impedance

Line: 30 mV [at reference input level (−15 dB indication)]/50 kohm

Microphone: 0.7 mV [at reference input level (−15 dB indication)]/600 ohm

Video: 1 Vp-p/75 ohm

■ Output level and impedance

Line: 400 mV [at reference input level (−15 dB indication)]/600 kohm

Video: 1 Vp-p/75 ohm

Digital dubbing (copying): 1 Vp-p/75 ohm

■ Accessory functions:

VTR tracking check
Battery check
Rec mute
Rec/pb level indication
Playback mode switch
Playback muting
Playback indicator
Headphone level control
Digital copy jack

Technics

Matsushita Electric Trading Co., Ltd.
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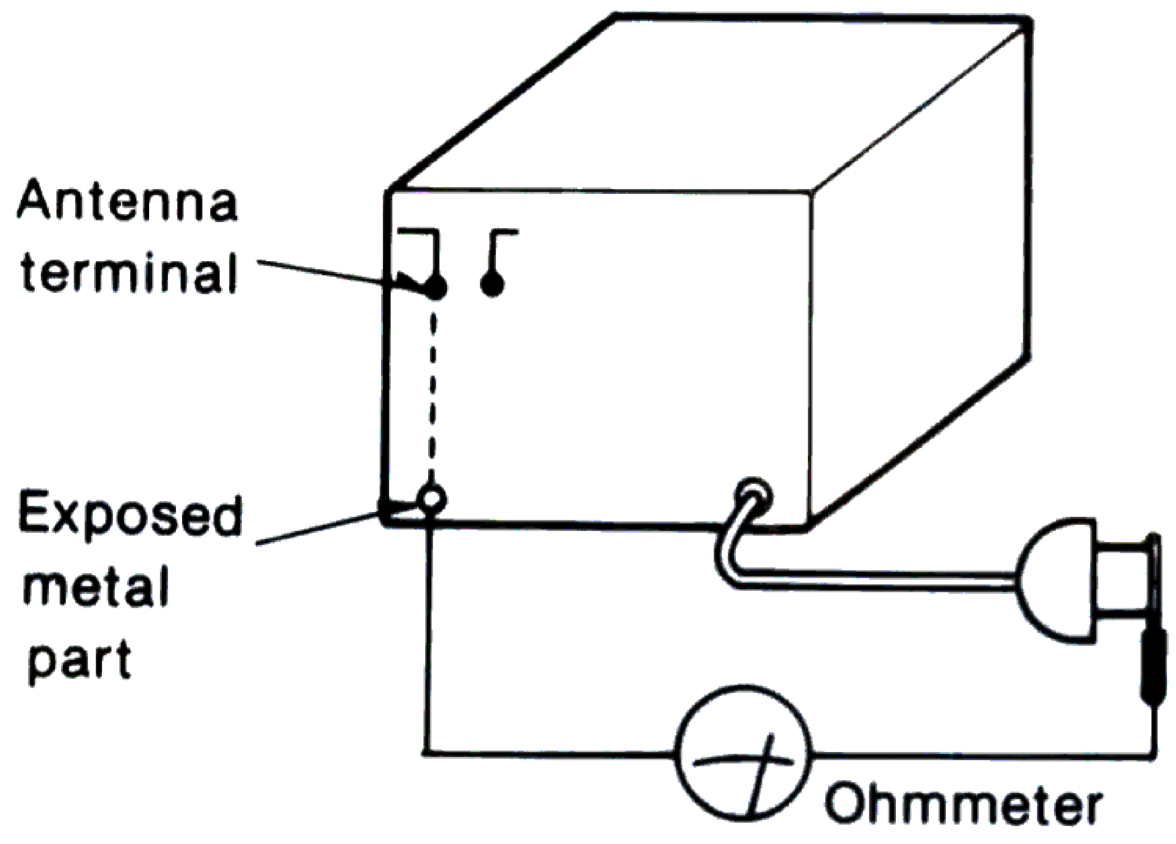
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

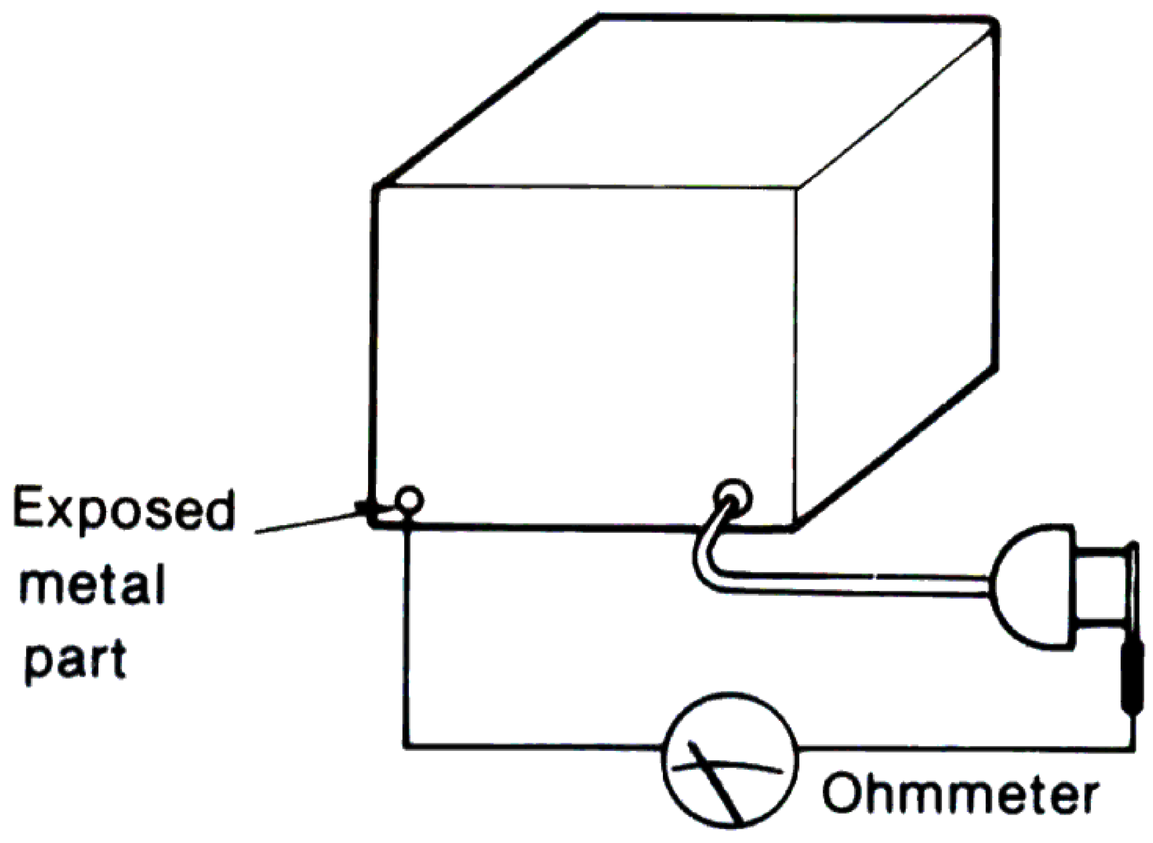
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3 MΩ—5.2 MΩ



(Fig. B)

Resistance = Approx ∞

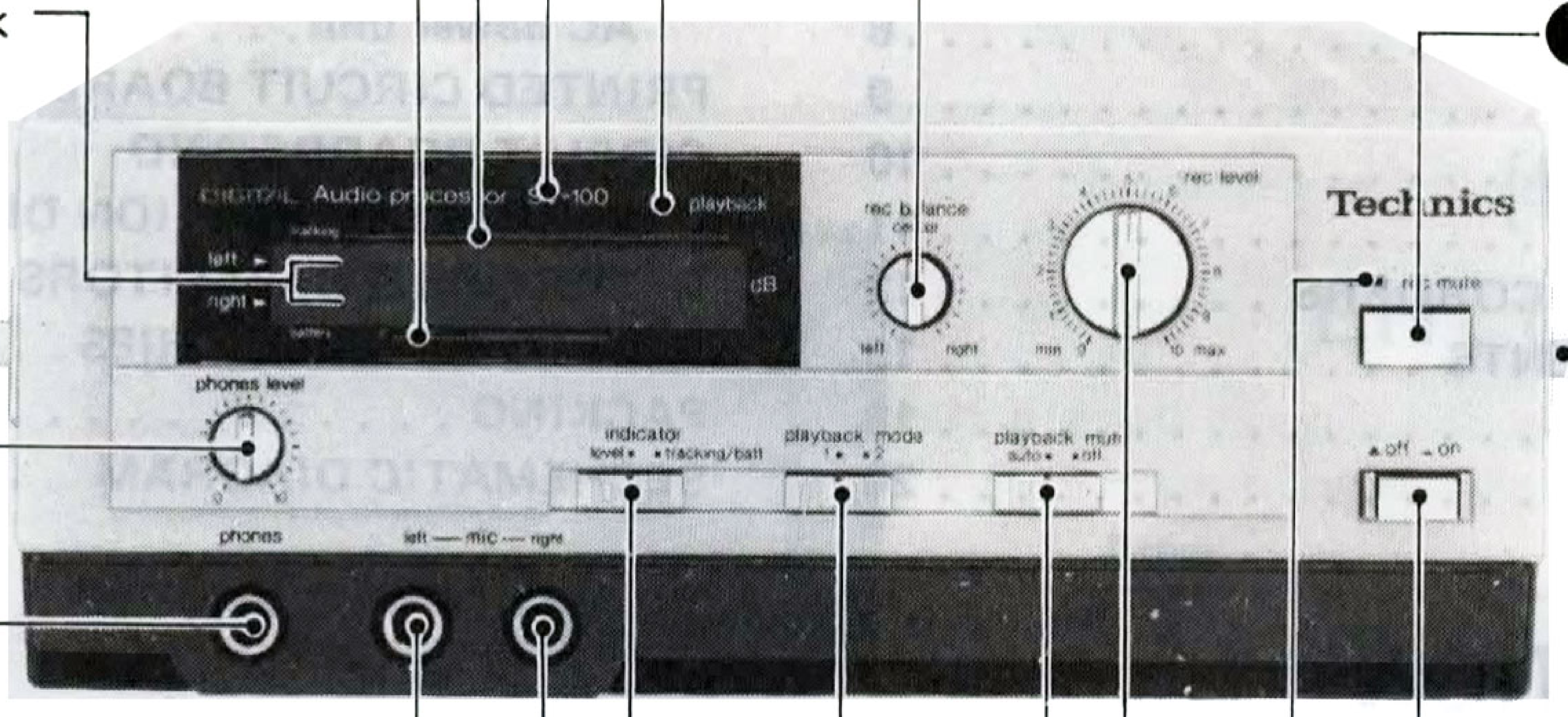
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

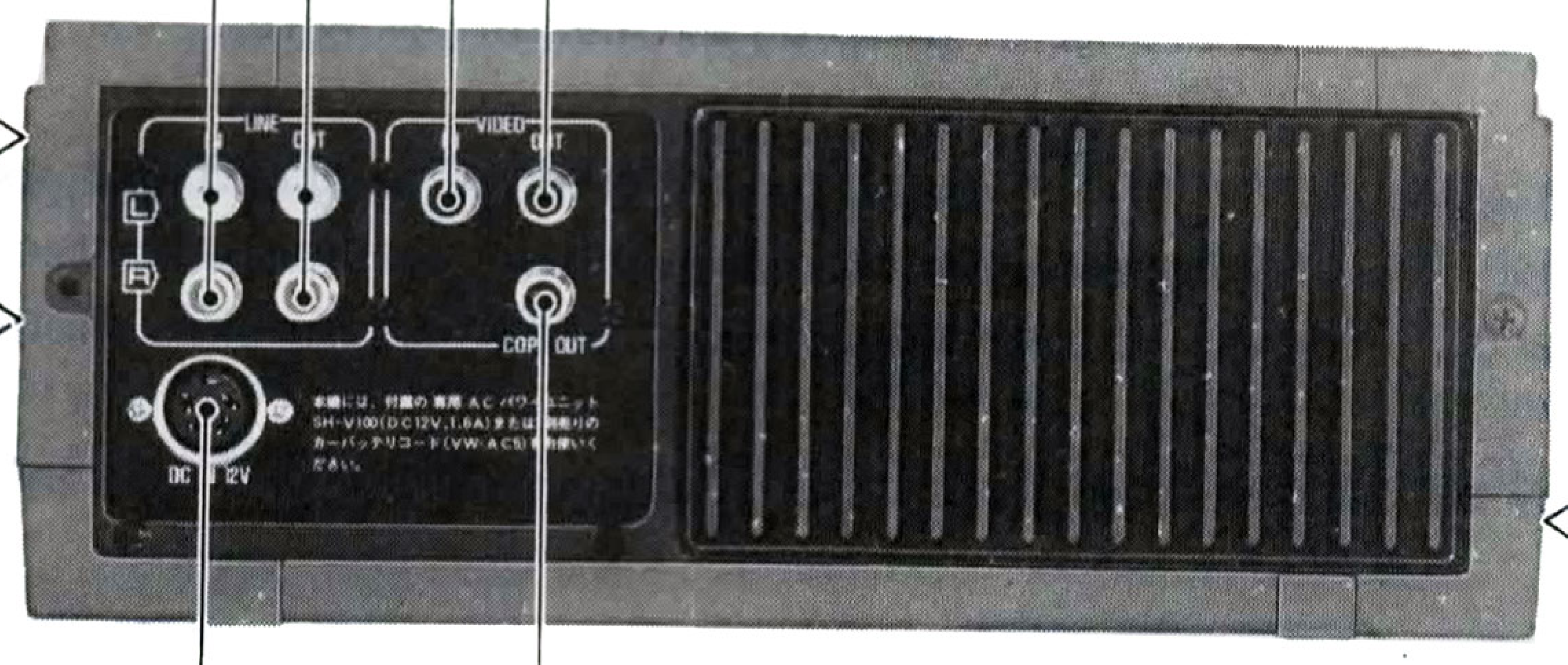
■ COPY OUT TERMINAL

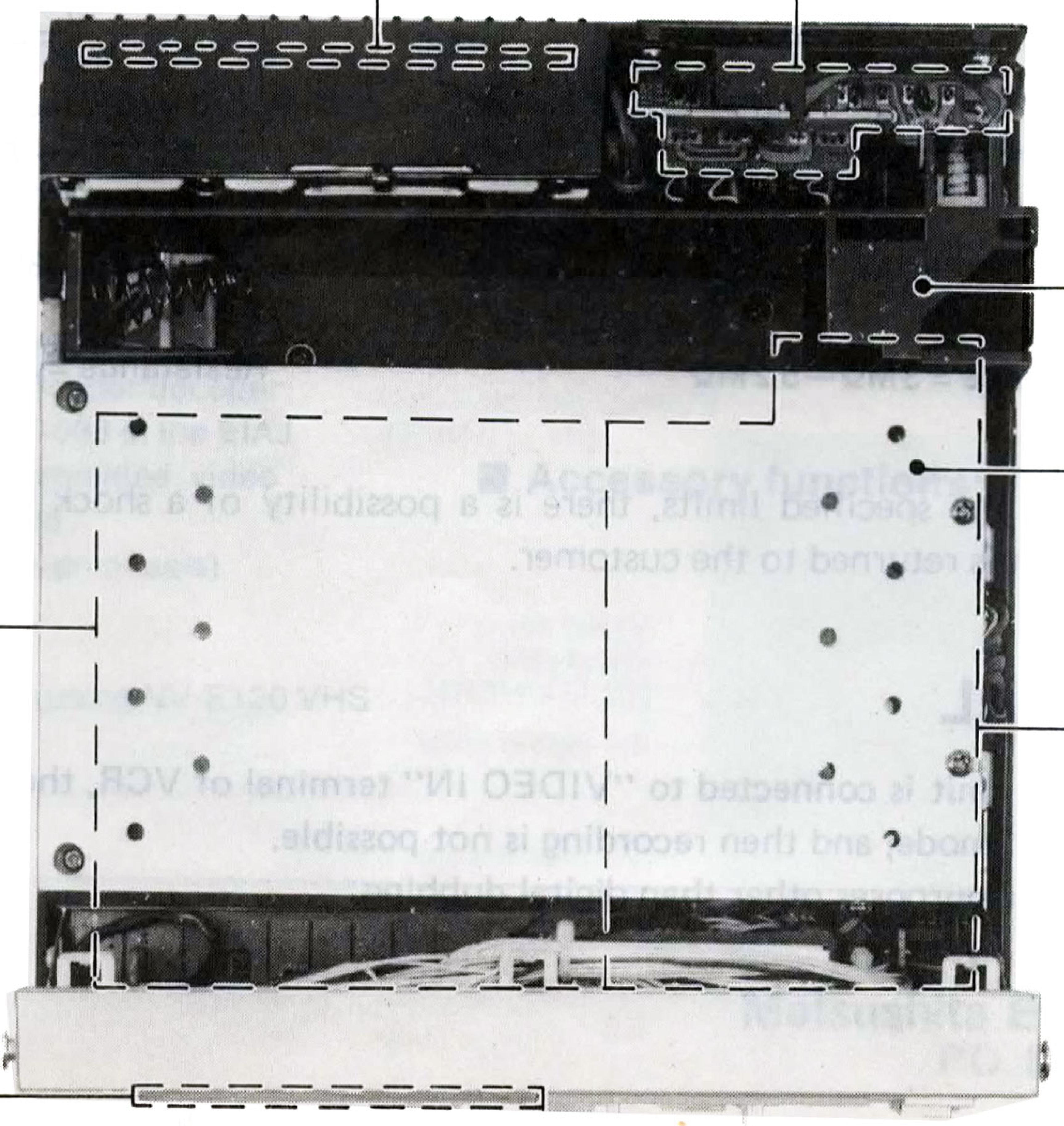
When "COPY OUT" terminal of this unit is connected to "VIDEO IN" terminal of VCR, the rec/playback mode of this unit is automatically shifted to "playback" mode, and then recording is not possible.
Do not use "COPY OUT" terminal for purposes other than digital dubbing.

■ LOCATION OF CONTROLS

• Main unit







• Functions

❶ Recording muting switch (rec mute)

Press when you want to record a blank space on the tape. Recording muting (no-signal recording) only takes place as long as this switch is kept depressed during recording.

❷ Recording level control (rec level)

Use to adjust recording level.

❸ Recording balance control (rec balance)

Used to adjust the balance between left and right channel recording level.
The "center" click-stop position is the standard setting.

❹ Display panel

Depending on operating condition, the display gives the following kinds of indication.
When the indicator switch is at the "level" position, the display shows recording and playback level for the left and right channels. The playback indicator lights up during playback.
When this indicator switch is at the "tracking/batt" position, the left channel scale provides tracking check indication, while the right channel scale provides battery check indication.

❺ Indicator switch

(**indicator**
level ■ ■ tracking/batt)

Used to change display function.

❻ Playback mode switch

(**playback mode**
1■ ■2)

Used to select the demodulation mode that best matches the playback signal characteristics of the VCR being used.

❼ Playback muting switch

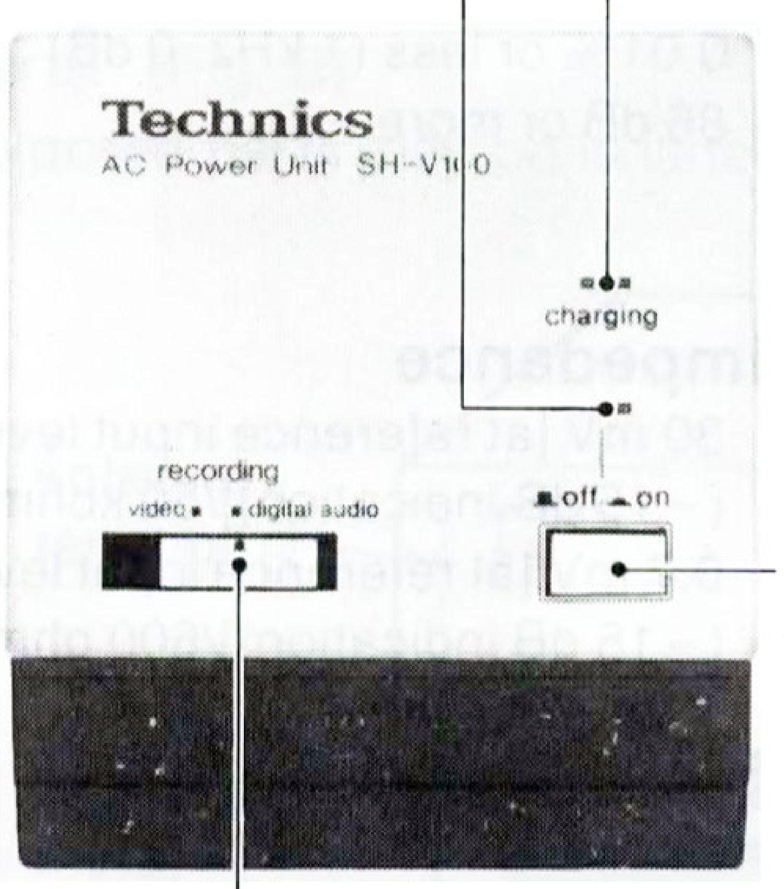
(**playback/mute**
auto ■ ■ off)

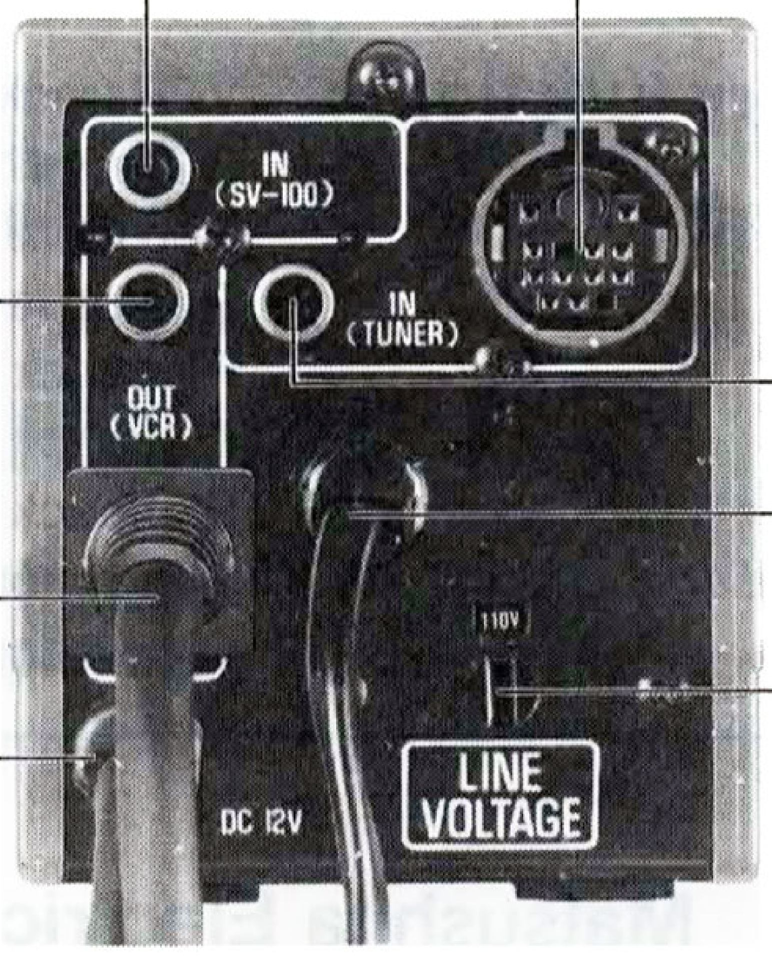
For normal playback, this switch is left at the "auto" position so that it automatically mutes the signal to minimize noise when dropouts (dirt or damage) appear on the tape.

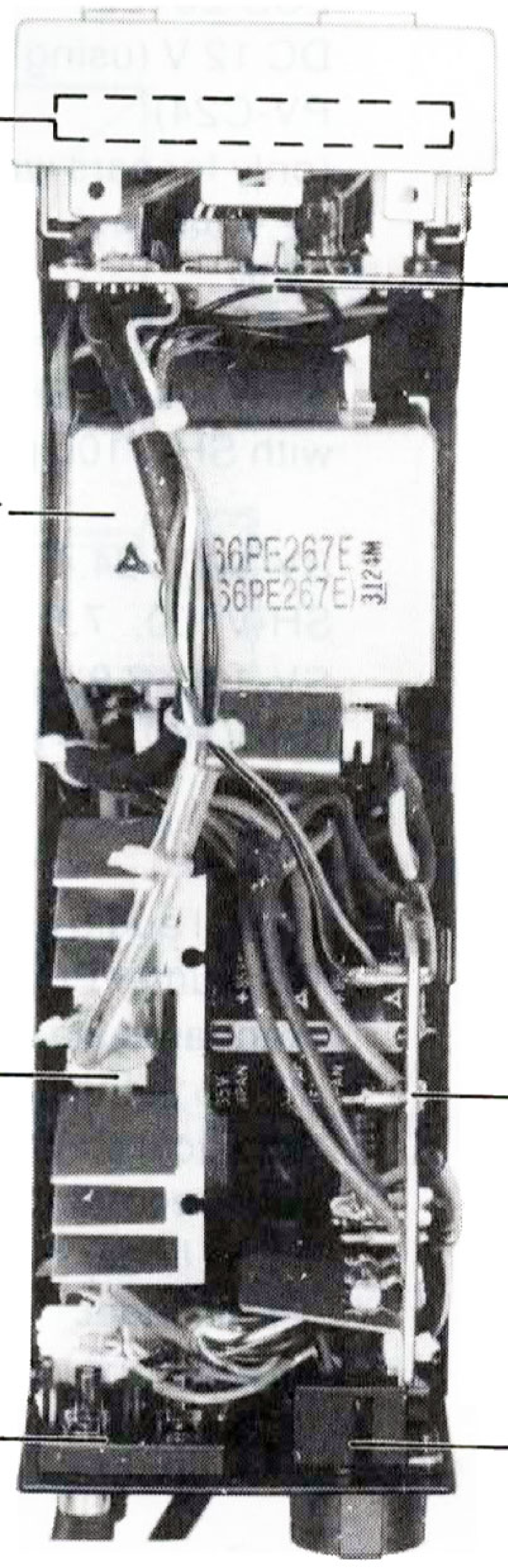
❽ Headphone level control (phones level)

Use to adjust headphone volume.

• AC power unit (SH-V100)







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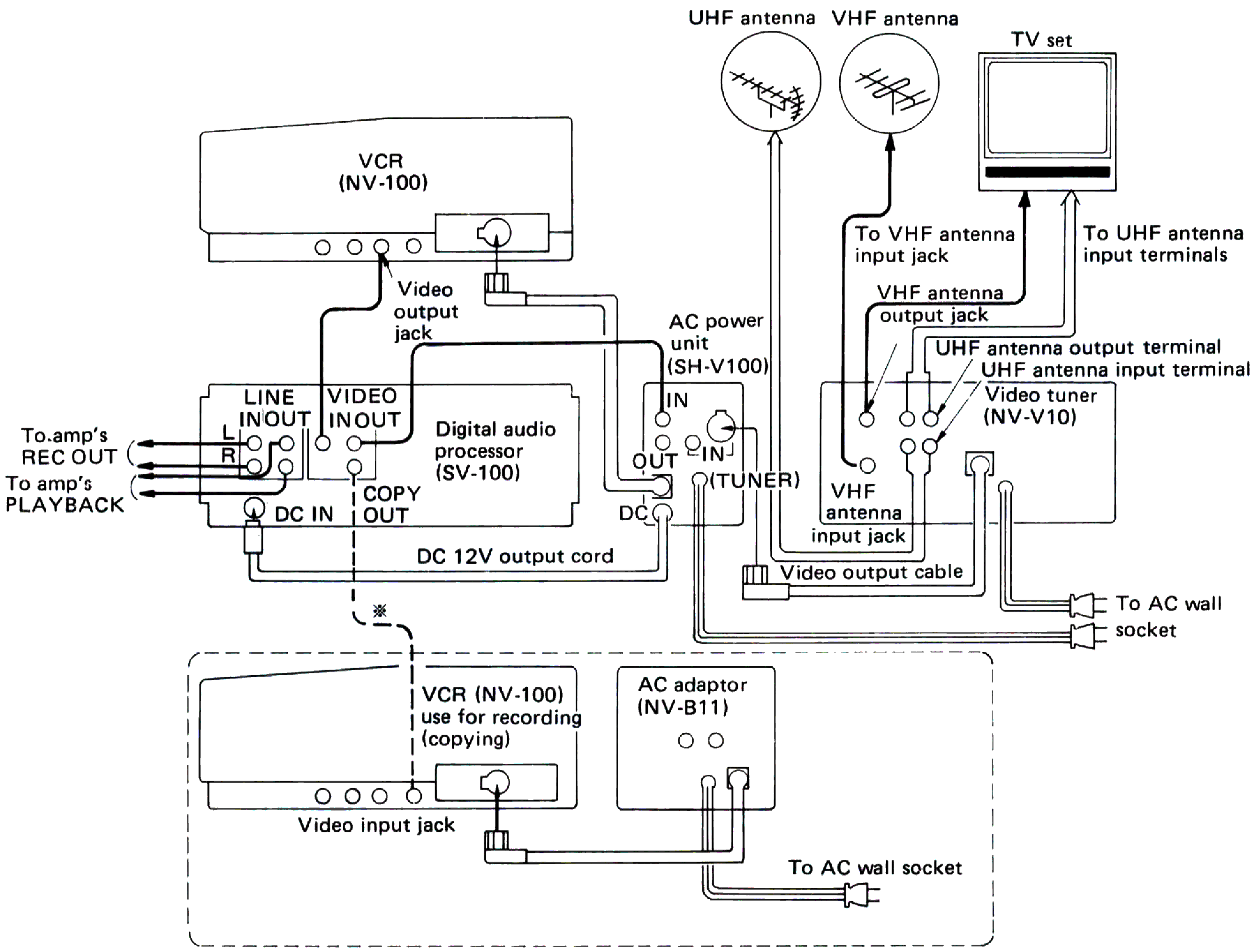
■ CONNECTIONS AND OPERATION

• Connection for recording and playback/TV program recording and playback

Note:

The following explanations apply to connections with the Panasonic NV-100VCR and NV-V10 video tuner.

1 In the connection diagram shown below, NV-100 power is supplied from the NV-V10 video tuner's power output cable, via the SH-V100 AC power unit's video output cable.
2. The AC power unit has a recording mode switch that lets you switch between PCM recording and video (TV) recording without having to change any connections.
3. For recording TV programs, set the SH-V100 AC power unit's front panel recording mode switch to the "video" position and then operate the video tuner and VCR as usual.
4. For video playback, set the NV-V10 video tuner's antenna switch to the "video" position and press the VCR's play button.
5. To view TV programs, set the NV-V10 video tuner's antenna switch to the "TV" position and turn on the TV.
6. If you do not have a video tuner, you can use the optional NV-B11 AC adaptor to allow PCM recording and playback as well as video playback (of recorded cassettes).
7. Connections are slightly different if using a monitor type TV (having a video output).



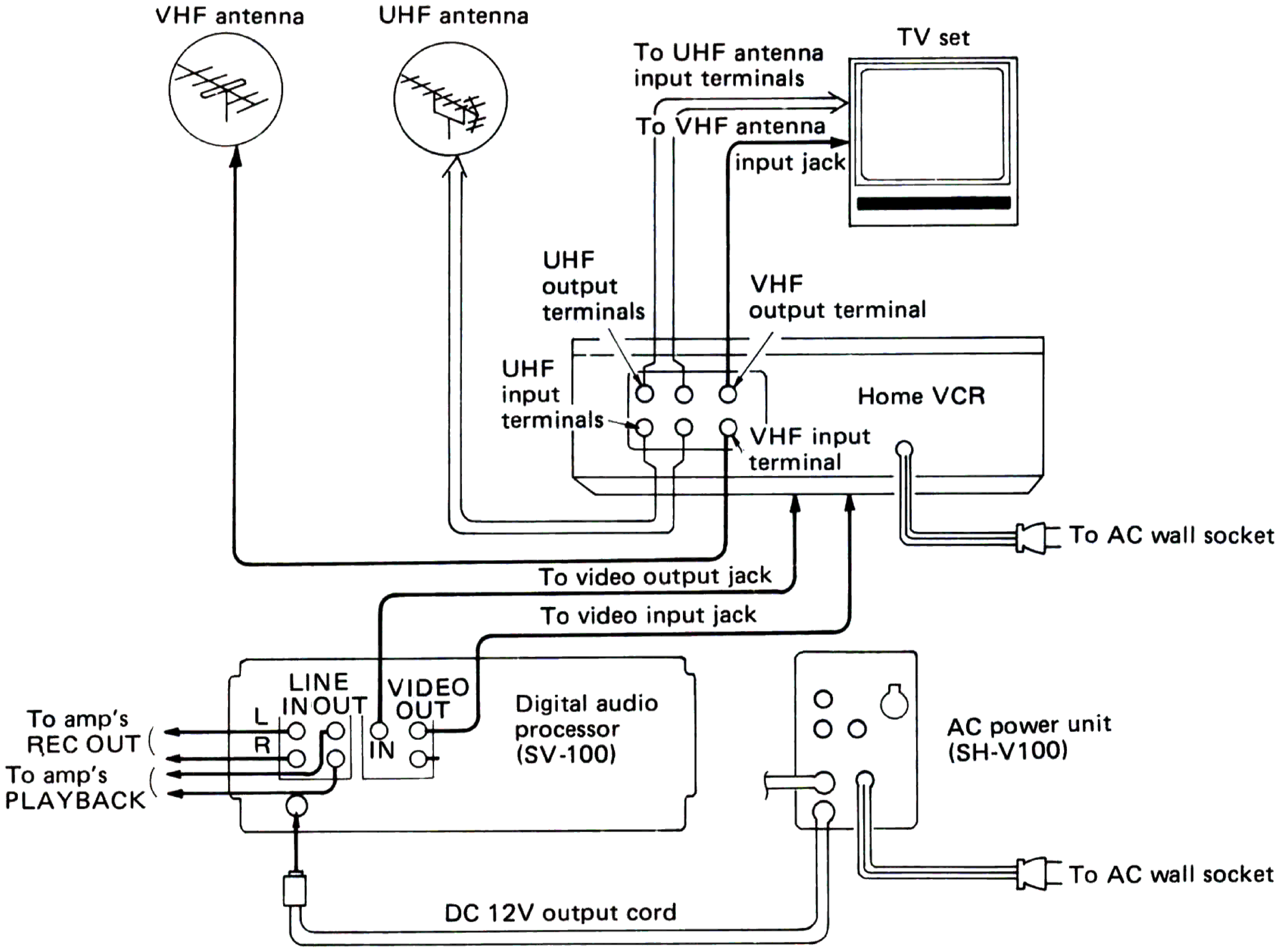
Connection for digital dubbing (copying) using two VCRs.

※ When not performing digital dubbing, be sure to unplug the video cord from the SV-100 copy out jack.

• Connection for recording and playback using a home (not portable) VCR

Note:

1. Use VCR's video input selector to switch between video (TV program) recording and PCM recording. Set to "camera" position for PCM recording. Set to "tuner" position for TV program recording. For details, see your VCR's operating instructions.
2. Some VCR's do not have a video input selector: instead, switching (to external input) is automatic when a plug is inserted in the VCR's video input jack. In this case, you must remove the plug from the video input jack if you want to record TV programs.



■ DISASSEMBLY INSTRUCTIONS (Main unit)

1. How to remove the cabinet

1. Remove the 2 setscrews **(Fig. 1 : ❶, ❷)** of the cabinet.
2. Remove the cabinet by slightly releasing the side-plates outwards. **(Fig. 1)**

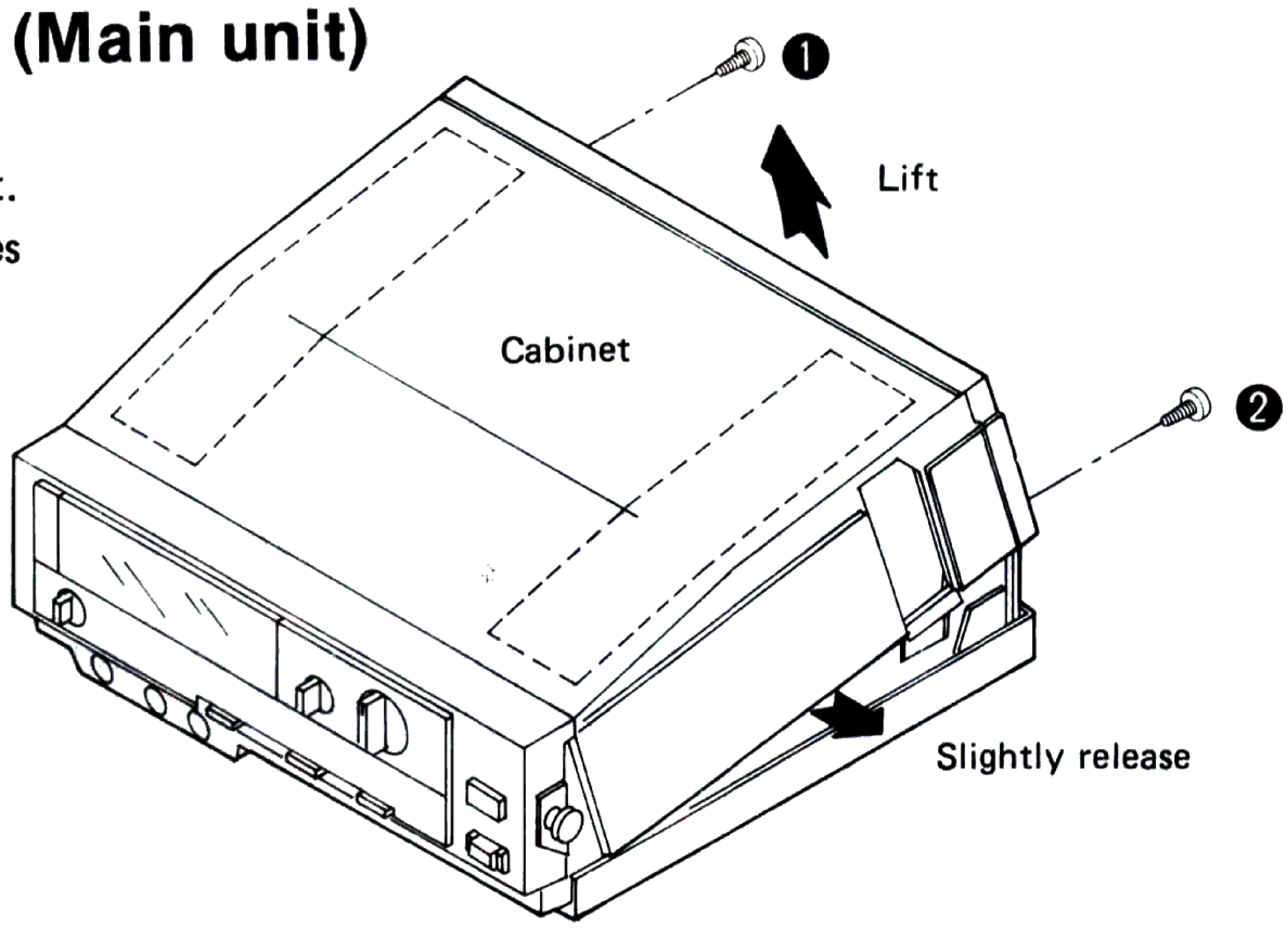


Fig. 1

2. How to remove the bottom board

1. Remove the 4 setscrews **(Fig. 2 : ❸ ~ ❻)** of the bottom board.
2. Remove the bottom board by lifting it from the rear part. **(Fig. 2)**

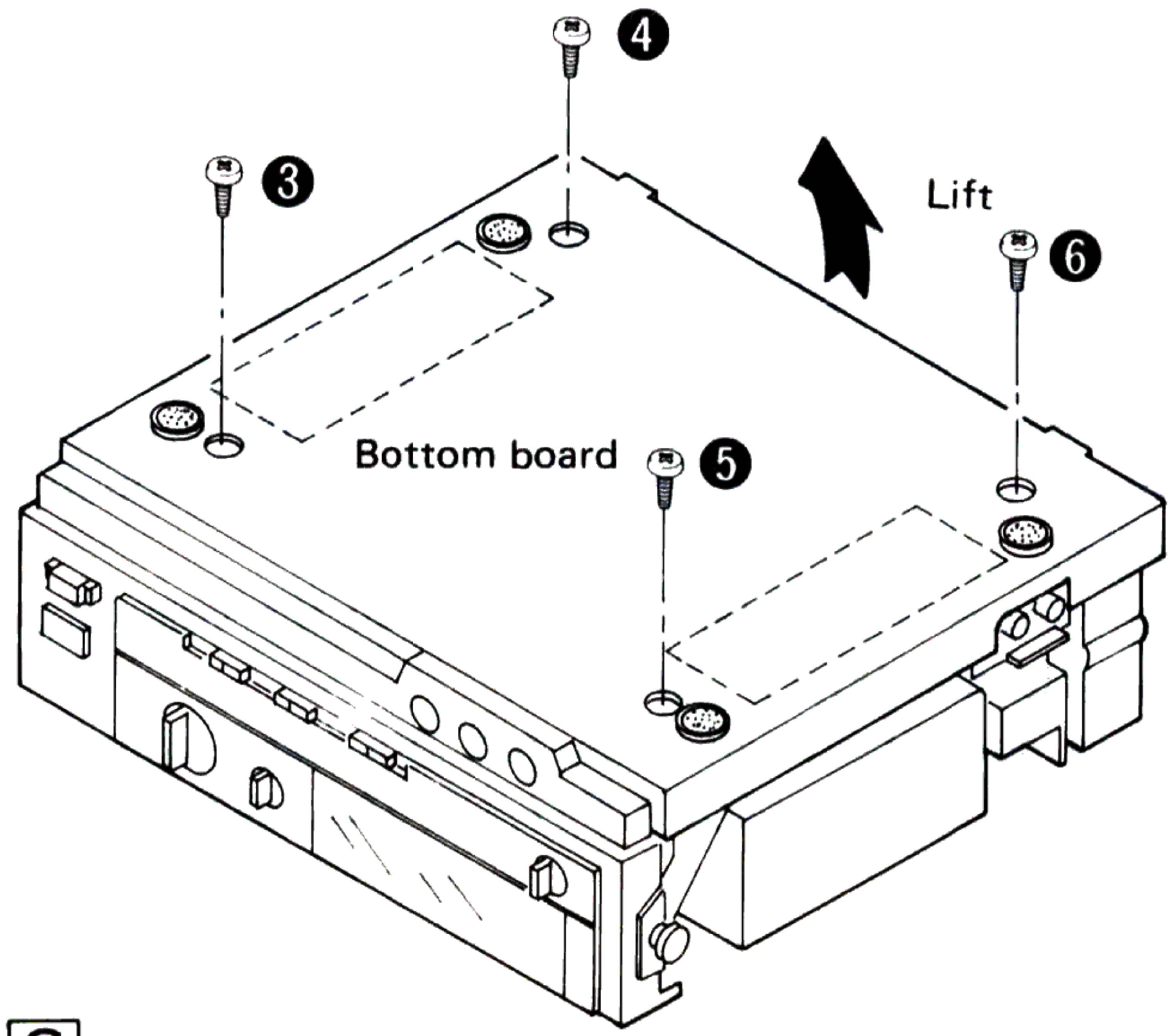


Fig. 2

3. How to remove the front panel

1. Remove each knob of rec level, rec balance, phones level, indicator, playback mode and playback mute. **(Remove these knobs according to Sec. 4 "How to remove the knobs".)**
2. Remove the 5 setscrews **(Fig. 3 : ⑦ ~ ⑪)** from the front chassis, and draw the front chassis in the direction of the arrow. **(Fig. 3)**
3. Pull out the 3 connectors **(Fig. 4 : ⓐ, ⓑ, ⓒ)** from the back of the front chassis.
4. Remove the 5 setscrews **(Fig. 4 : ⑫ ~ ⑯)** from the front panel.
5. Set it up by reversing the procedure.

4. How to remove the knobs

- **Removal of rec level, rec balance, and phone level knobs.**
  Stick the cellophane tape to the knob as in **Fig. 5**, and pull the tape to remove the knob. If it is hard to remove, cover the knob with cloth and pull out the knob by use of pincers or the like.
  (Take special care not to scratch the knob.)

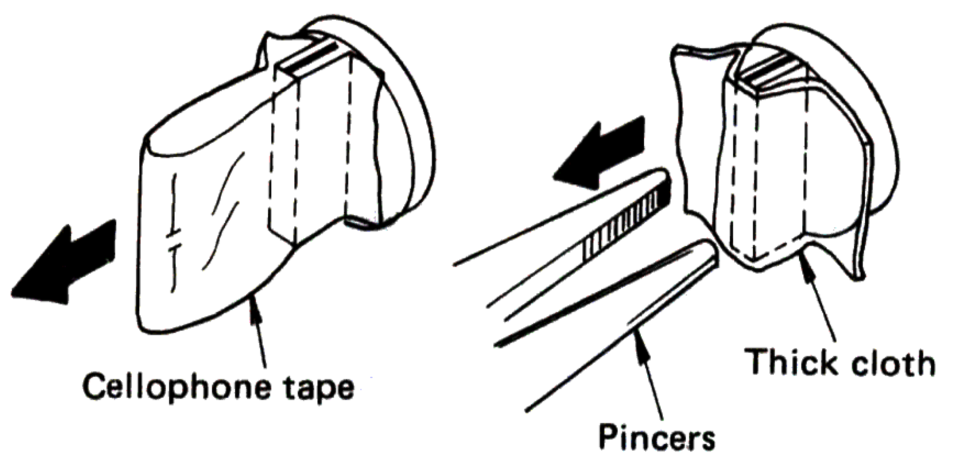


Fig. 5

- **Removal of indicator, playback mode, and playback mute knobs.**

1. Prepare a strong thread like nylon yarn and an eyeleteer or small screwdriver.
2. Set the thread into the gap between the front panel and the knob sufficiently until it is caught by the knob.
3. Pull the thread to remove.

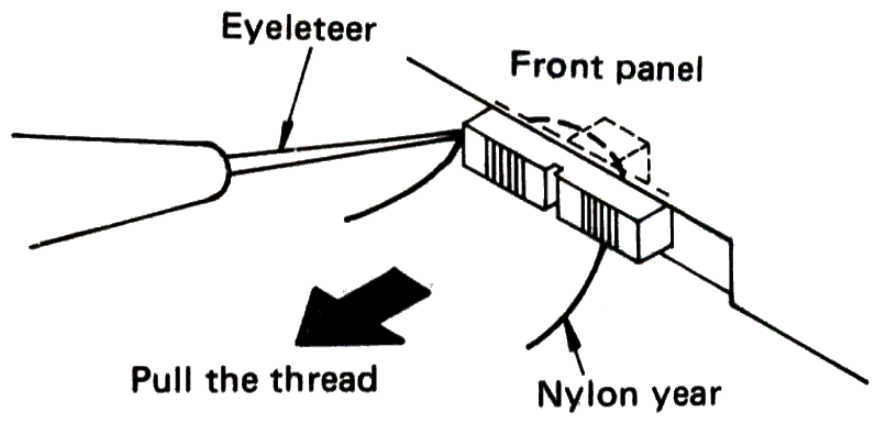


Fig. 6

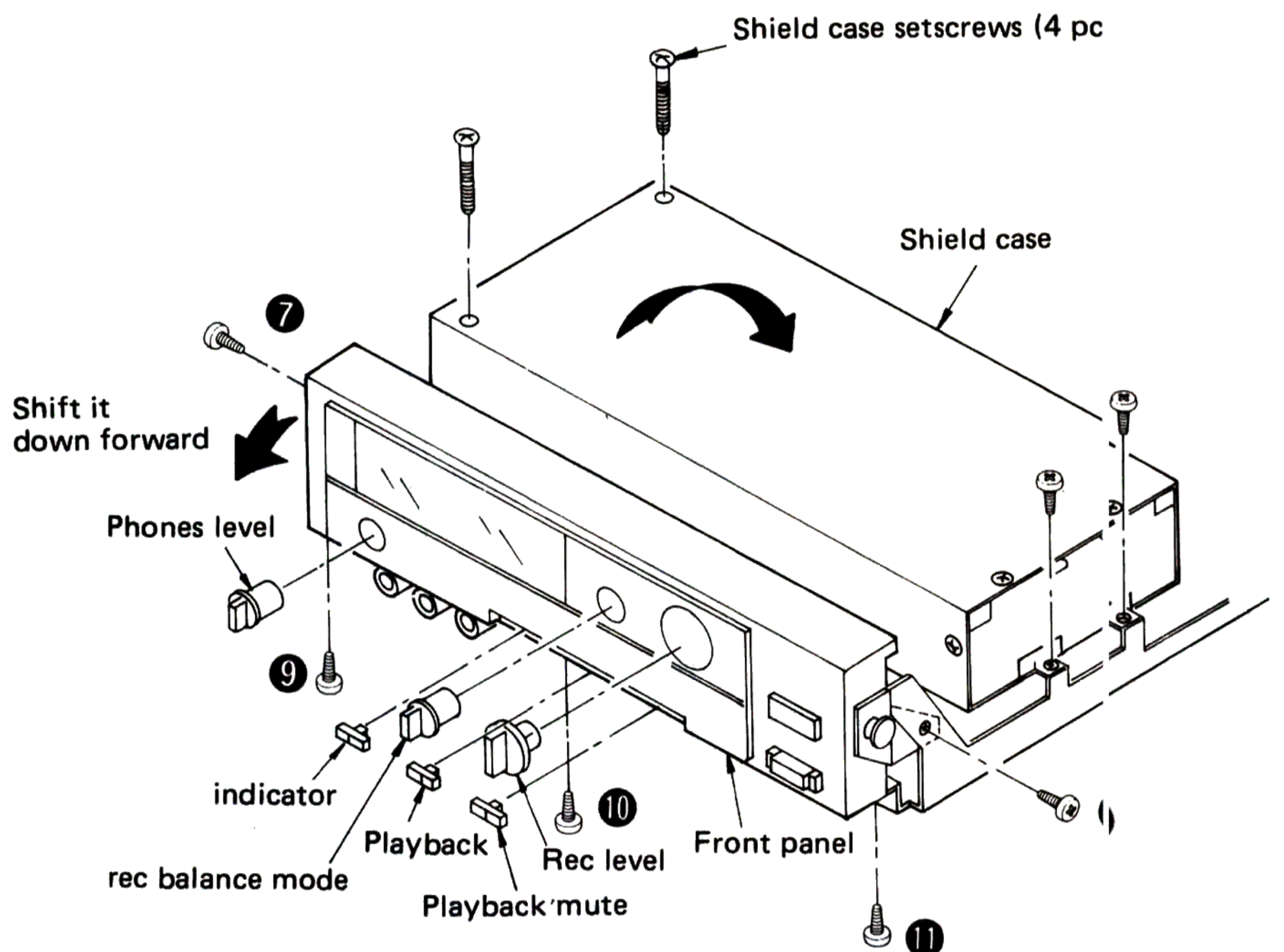


Fig. 3

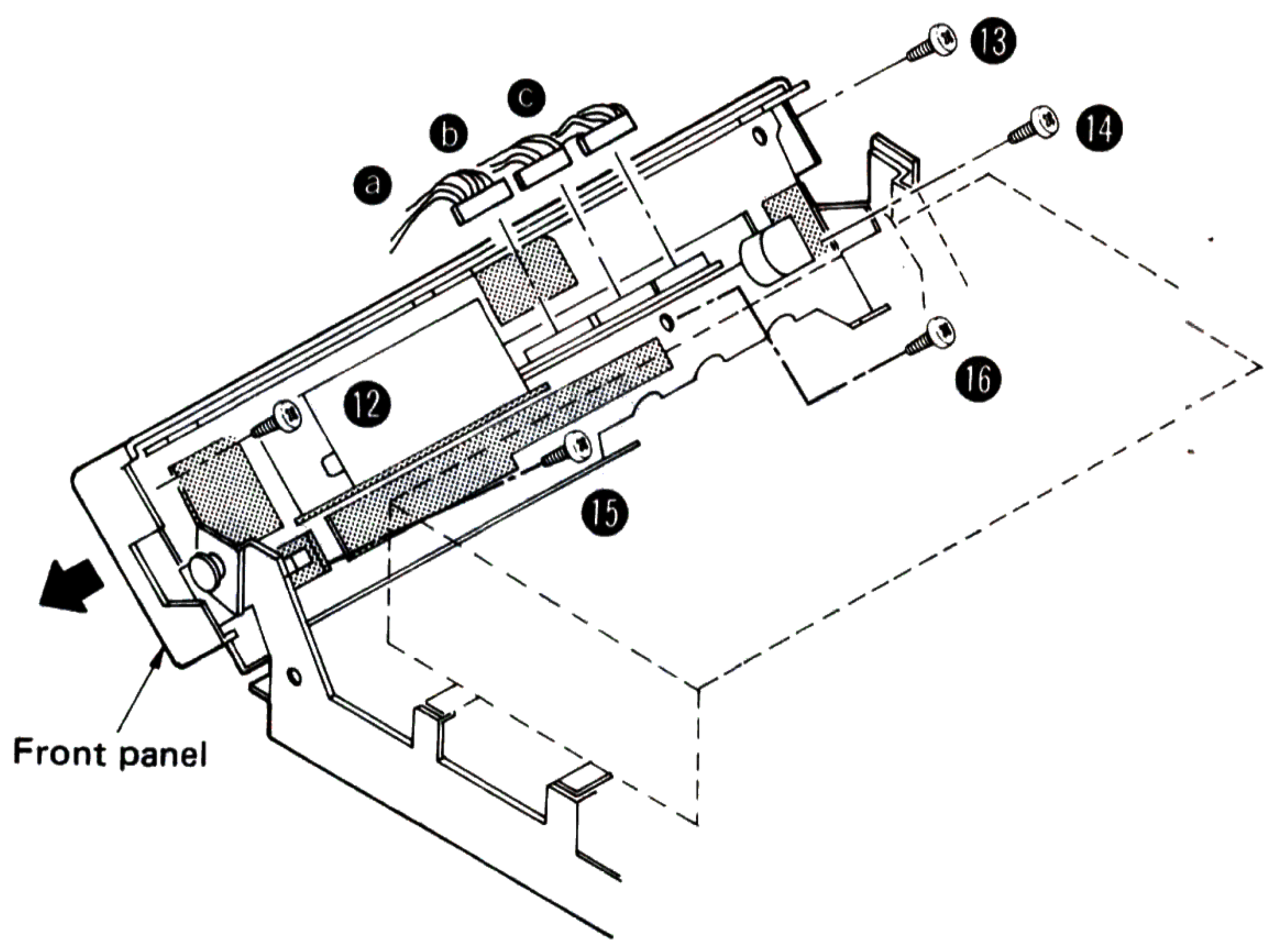


Fig. 4

5. How to remove the shield case and P.C.B.

1. Remove the cabinet.
2. Remove the 4 setscrews **(Fig. 3)** of the shield case, and remove the shield case from the main body.
3. Remove the 6 setscrews of the shield case to pull out the shield case. **(Fig. 7)**
4. Release the 2 claws of the holder, and remove the holder.
5. To remove the synchronizing P.C.B., remove the 2 setscrews **(Fig. 7 : ⑲, ⑳)** and pull it out in the direction of the arrow.
6. To remove the video P.C.B., remove the 2 setscrews **(Fig. 7 : ㉑, ㉒)** and pull it out in the direction of the arrow.
7. To remove the digital P.C.B., remove the video P.C.B. and 2 latches **(Fig. 7 : ⓐ)**.
8. To remove the shield case, pull out the 7 connectors (terminal No. A3, A6, F2, F17, C2, JA1, JA2).

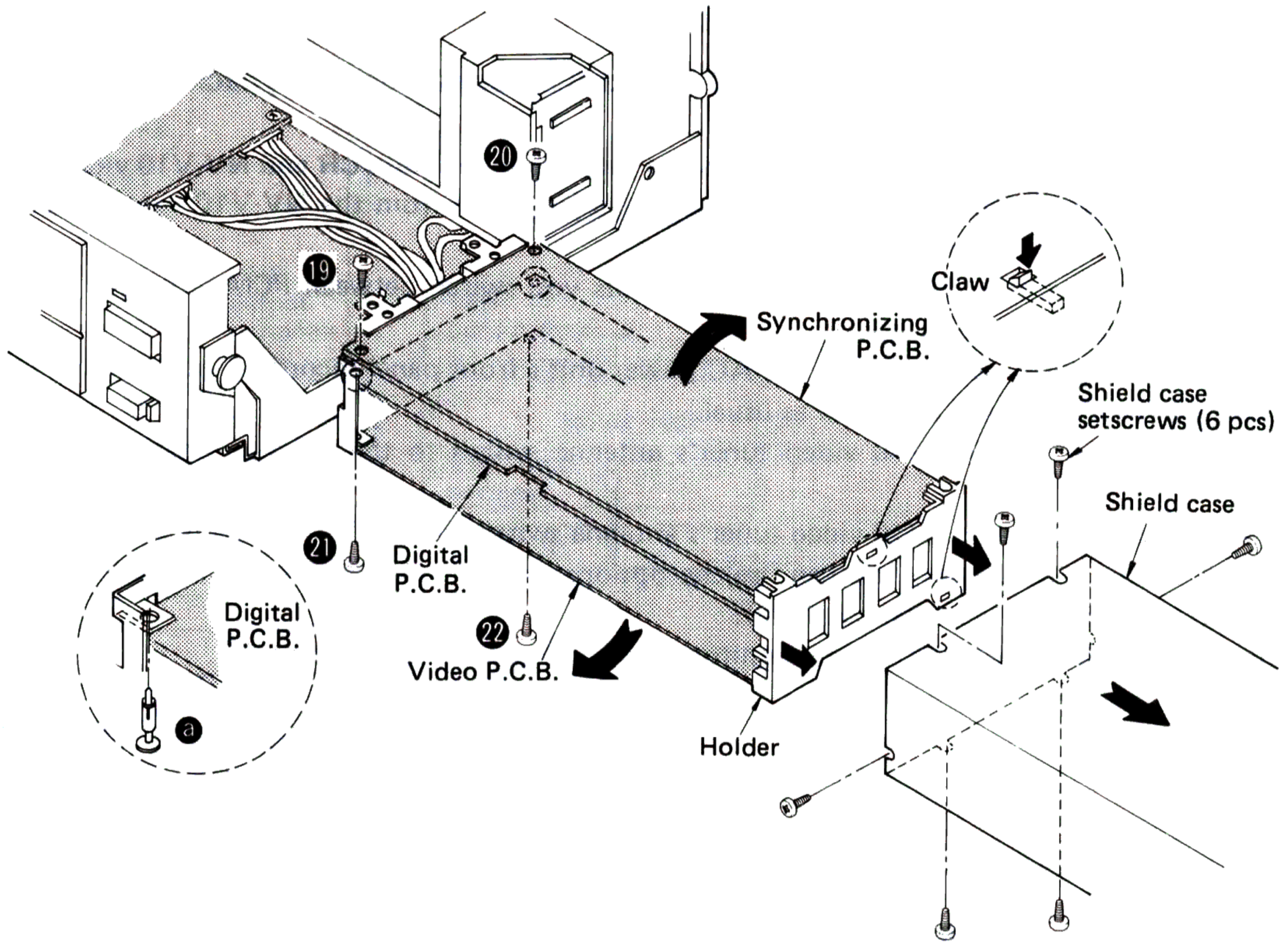


Fig. 7

6. How to remove the analog P.C.B.

1. Remove the cabinet and bottom board.
2. Remove the shield case.
3. Remove the front chassis and pull out connector (A7).
4. Remove the 2 setscrews **(Fig. 8 : ㉓, ㉔)** and nut of the analog P.C.B. Then remove the P.C.B. as in **Fig. 8.**

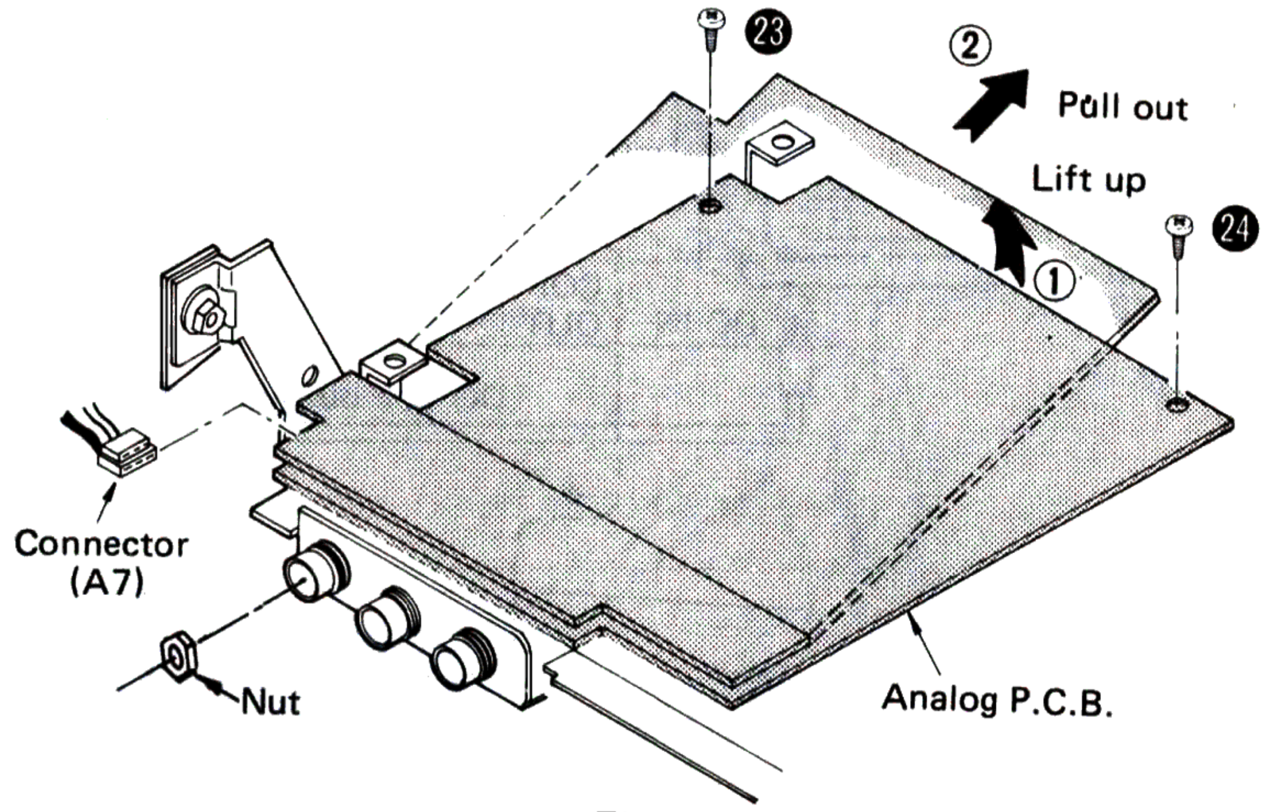


Fig. 8

7. How to remove the display P.C.B.

1. Remove the analog P.C.B.
2. Remove the battery case. **(Refer to Sec. 8 "How to remove the battery case.")**
3. Remove the 3 setscrews **(Fig. 9 : ㉕ ~ ㉗)** of the display P.C.B. Then raise the P.C.B. as in **Fig. 9.**
4. Thus the circuit can be checked. If the P.C.B. has to be completely removed, pull out 15 connectors (terminal No. F1, F3 ~ F13, F15, F16, F18).

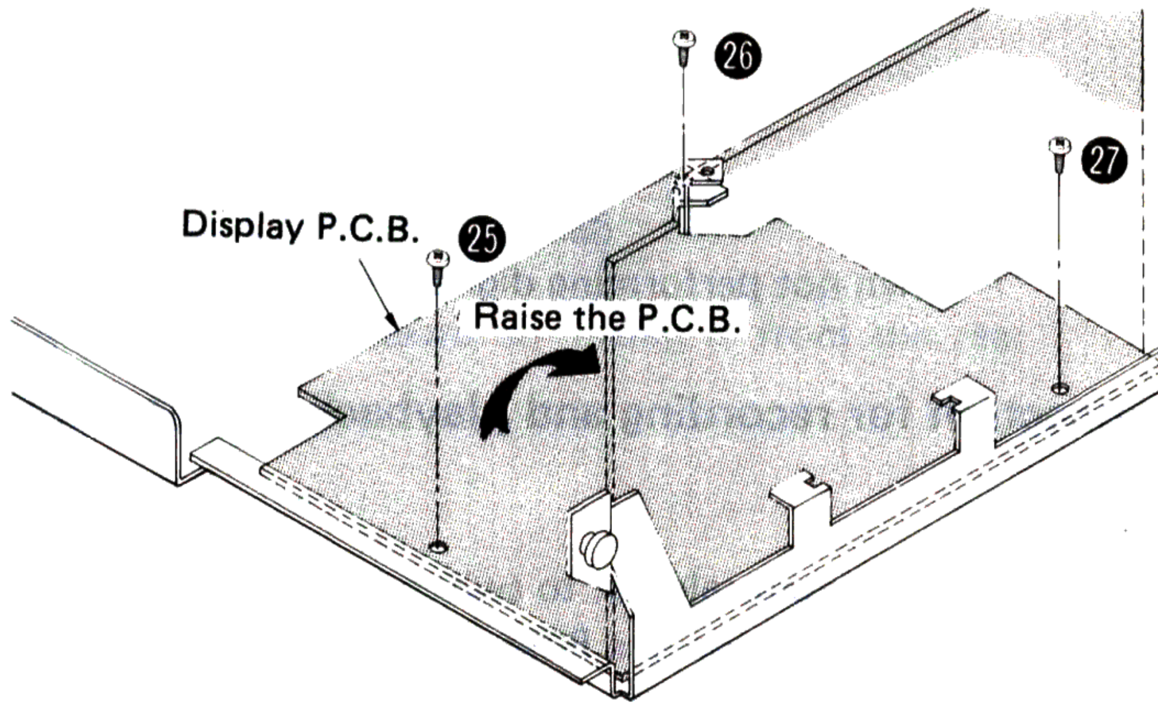


Fig. 9

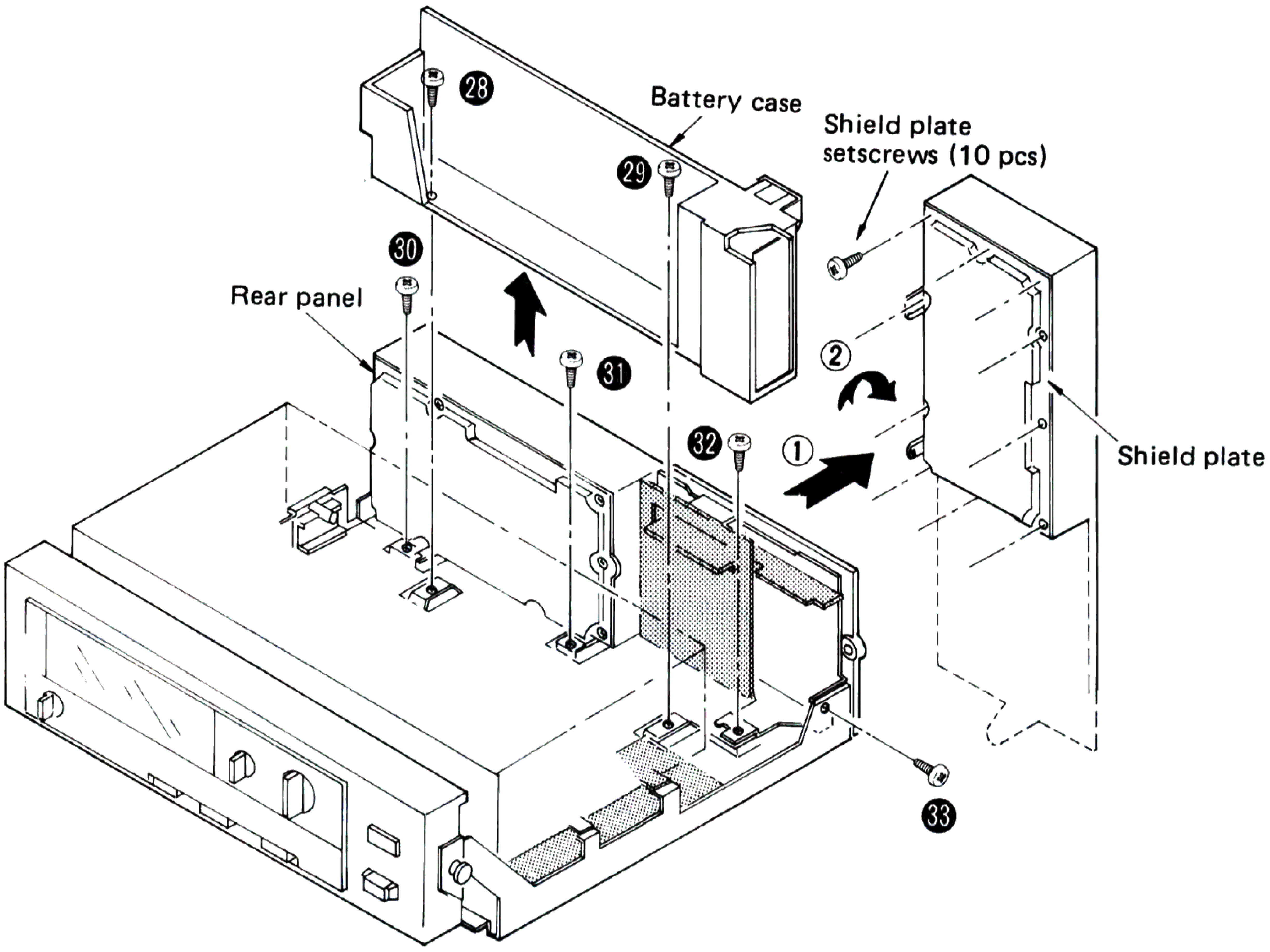


Fig. 10

8. How to remove the battery case

1. Remove the cabinet.
2. Remove the shield case.
3. Remove the battery case setscrews (**Fig. 10 : (28) , (29)**) and connector (F14).

9. How to remove the power supply P.C.B.

1. Remove the bottom board.
2. Remove the battery case.
3. Remove the 4 setscrews (**Fig. 10: (30) ~ (33)**) to draw out the rear chassis.
4. Raise the rear chassis as in **Fig. 10** and remove the shield plate setscrews (10 pcs).
5. Remove the 2 setscrews (**Fig. 11 : (34) , (35)**) of power supply P.C.B.

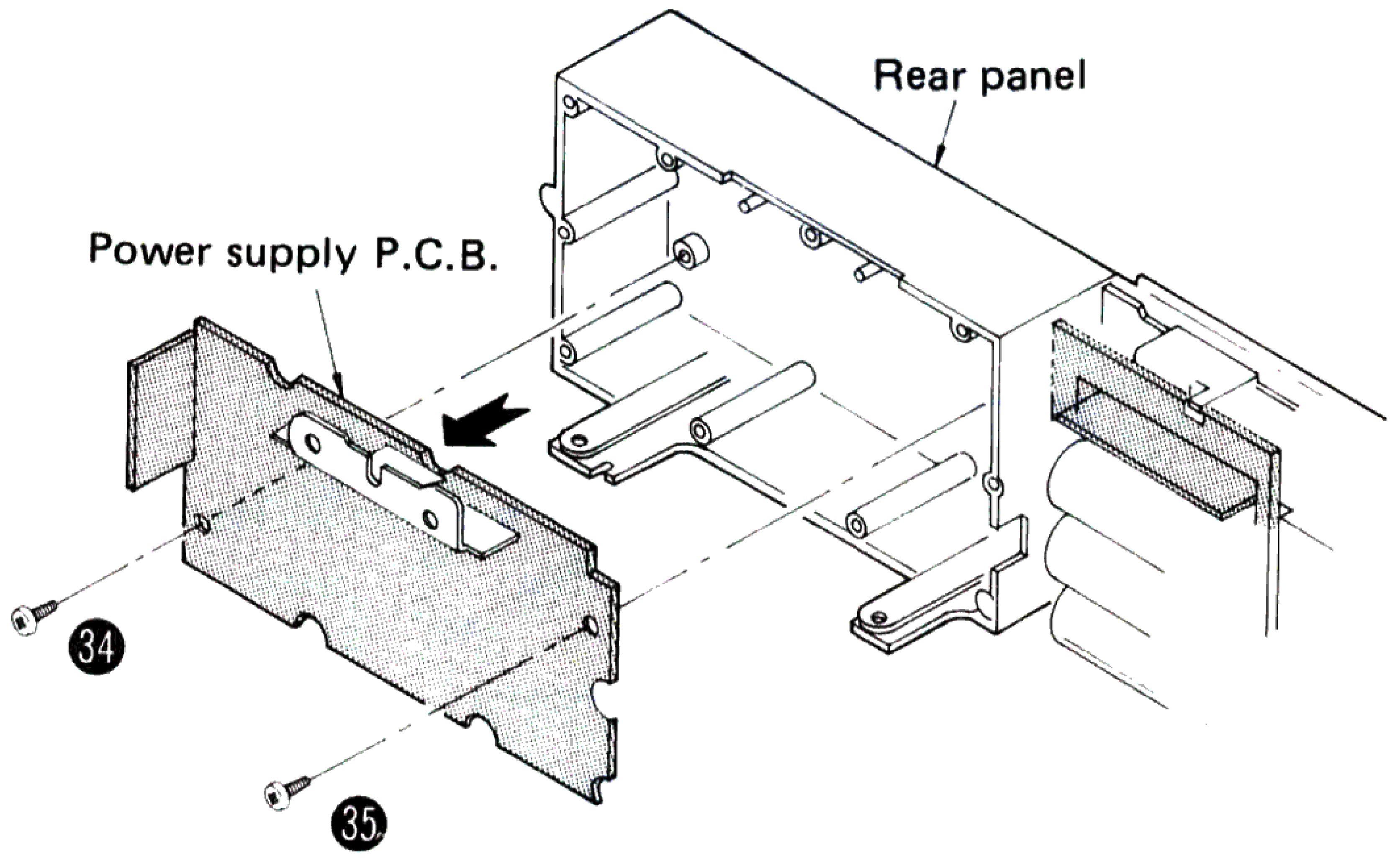


Fig. 11

■ DISASSEMBLY INSTRUCTIONS (AC power unit)

1. How to remove the cabinet

1. Remove the cabinet setscrew (**Fig. 12 : (36)**).
2. Remove the cabinet, releasing the side-plates outwards by hands.
3. To fit the cabinet, first let the cabinet claw engage with the front panel.

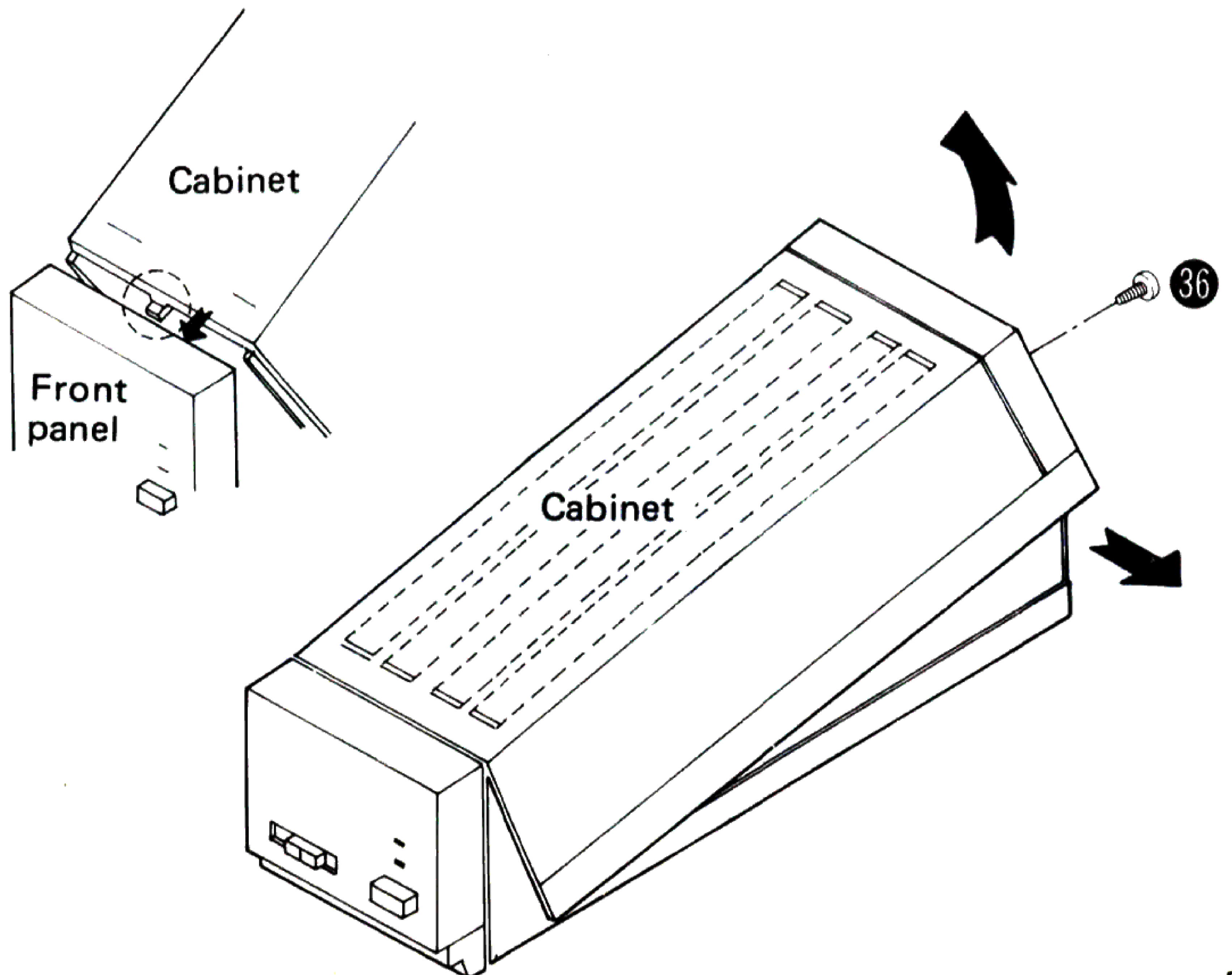


Fig. 12

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2. How to remove the front panel

1. Remove the cabinet.
2. Remove the front panel setscrews (**Fig. 13 : ㊲ , ㊳**) and shift it down in the direction of the arrow.
3. To fit the front panel, first let the bottom claw engage with the chassis.

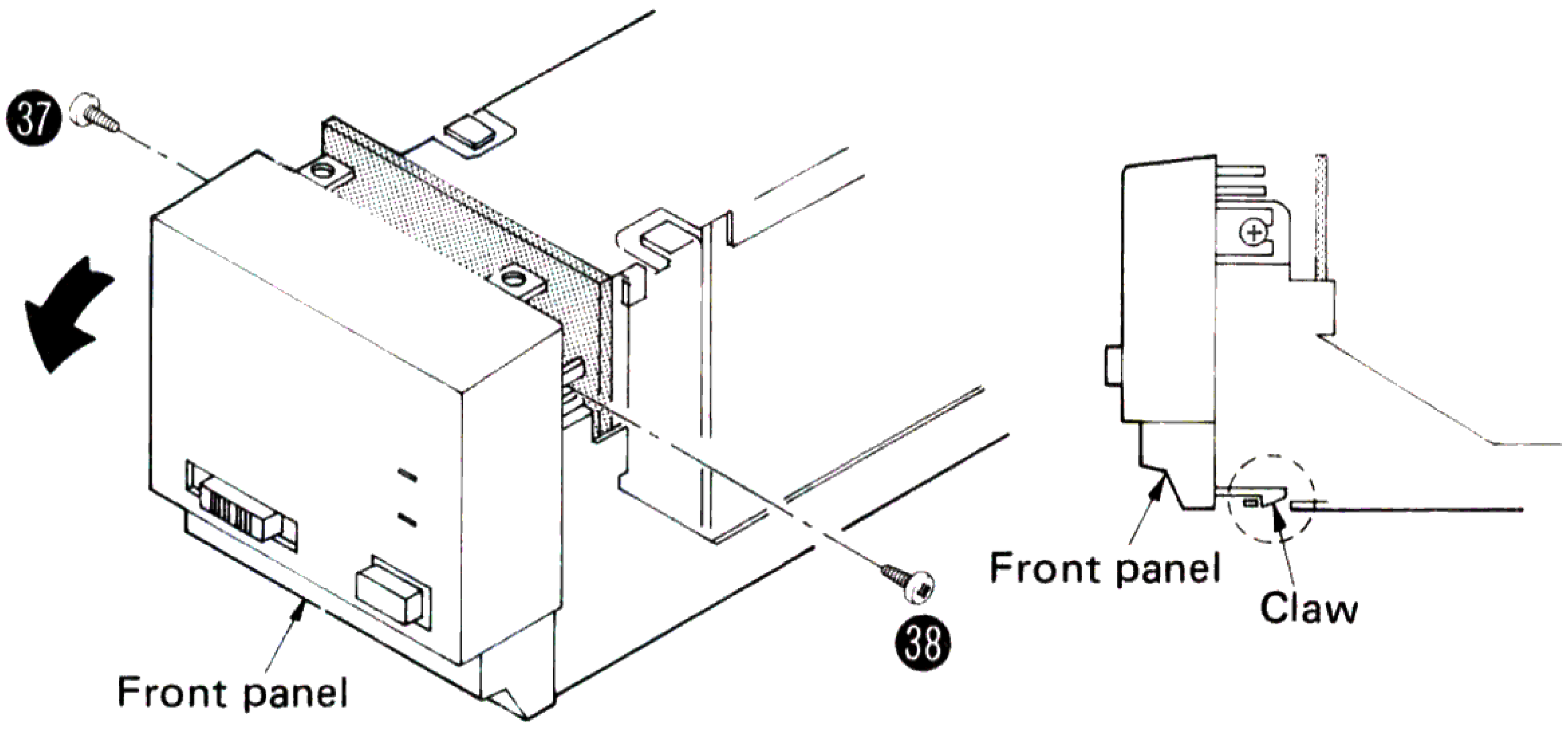


Fig. 13

3. How to remove the fuse

1. Remove the cabinet.
2. Remove the fuse P.C.B. setscrews (**Fig. 14 : ㊴ , ㊵**) and fuses (F701, 702)

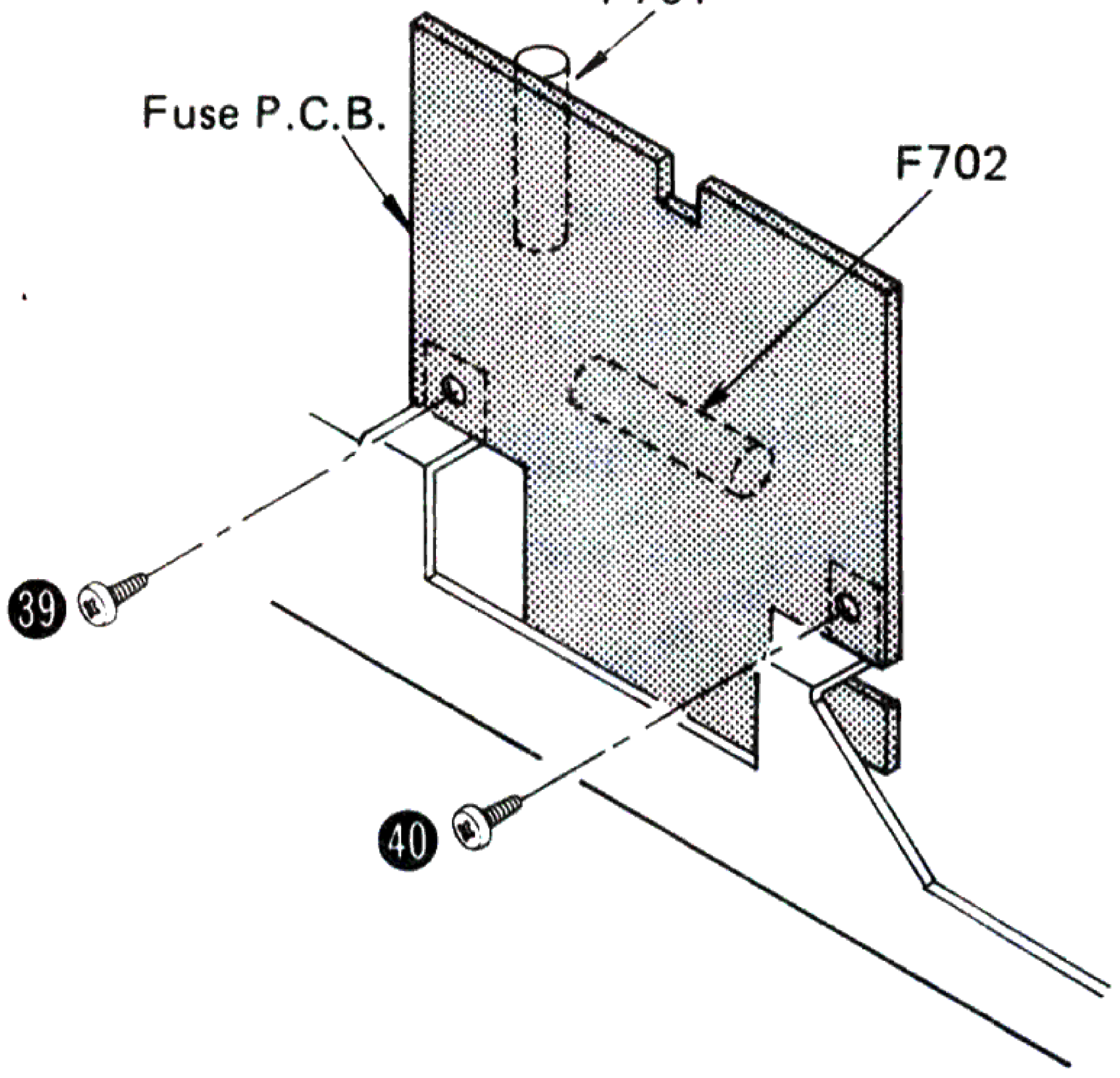


Fig. 14

• How to remove the power transistor

1. Remove the cabinet.
2. Remove the power transistor setscrews (**Fig. 15 : ㊶**) as in **Fig. 15.**
3. Unsolder the transistor.

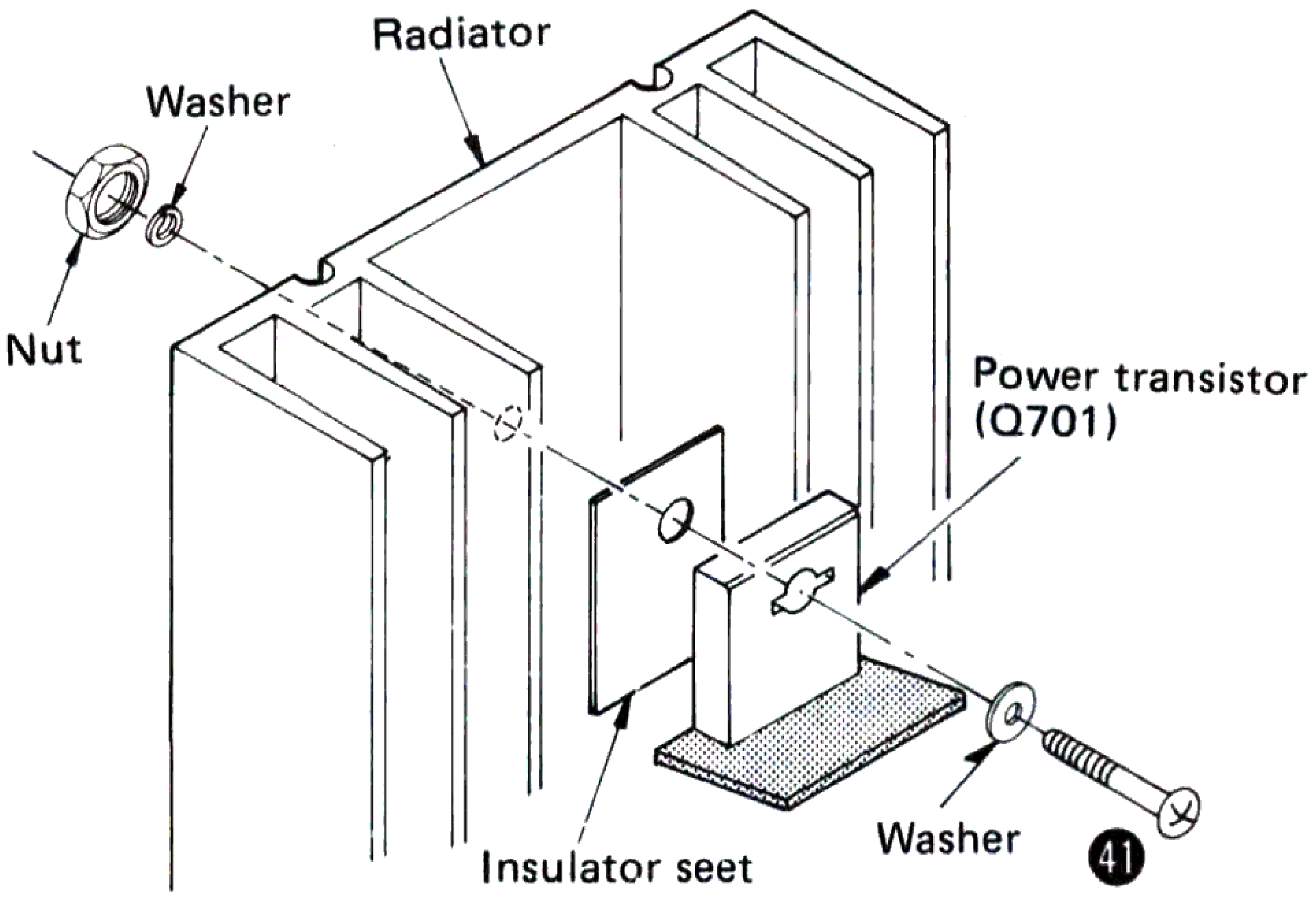


Fig. 15

■ TROUBLE SHOOTING

Check the connection of each instrument and knob position before repair, and use the table below.

Problem	Cause	Solution
Power is not supplied.	* Battery pack is dead. (If using battery pack) * AC power unit connection is not perfect. * AC power unit is defective. * Power supply circuit is defective.	* Change with AC power unit. * Completely connect DC 12V output cord. * Check output voltage of AC power unit. * Check power supply circuit.
No recording with video in rec mode.	* Video cassette lug is broken. * Switch of AC power unit is at "video". * Recording level is low. (When level indicator is not deflected.)	* Cover the hole in the cassette with tape. * Set it to "digital audio". * Adjust recording level watching the level indicator.

Problem	Cause	Solution
Neither recording nor playback are possible.	* VCR is defective. * The unit is out of order.	* Check VCR and unit with reference to **"Checking by use of a TV set"** given in the following.
Noise is made during playback. Playback quality is poor.	* Video cassette tape is defective. * Tracking adjustment is not sufficient. * VCR head area is stained. * Recording was made at VCR's EP or LP (long recording time) setting.	* Play another recorded tape. If playback is perfect, the previous tape is defective or recording conditions are bad. (It can also be checked by recording a picture on the tape to check for noise.) * Select either "1" or "2" of playback mode. Also, adjust tracking of the VCR used. * Clean the VCR's video head. * Make a new recording with the VCR set to the SP position.
Playback sound is distorted.	* Recording level is too high or low. * Analog circuit is defective.	* Select optimum recording level. * Check analog circuit.
With power ON, noise is made from radio and TV.	* Switching power supply and high frequency signal are handled in power supply circuit. So, there is slight leakage of high frequency signal.	* Keep the unit away from the tuner or radio. * Replace the indoor antenna with outdoor antenna.
Hum noise occurs.	* Power cord or fluorescent light is too close to the connection cord.	* Connect the power plugs of amplifier and AC power unit in opposite positions.
TV program recording is not possible.	* Switch of AC power unit is at "digital audio".	* Set it to "video".

■ CHECKING BY USE OF A TV SET

If recording and playback are not possible or noise is made during playback, it can be checked by using a TV to check whether the cause is in the unit or in video.

• Check of VCR

1. Record a picture on the VCR.
2. Play it on the TV. If the picture is normal, then the VCR is normal.
3. If noise is excessive on the picture, the possible causes are scratches on the tape, insufficient adjustment of tracking, and stains on VCR's head.

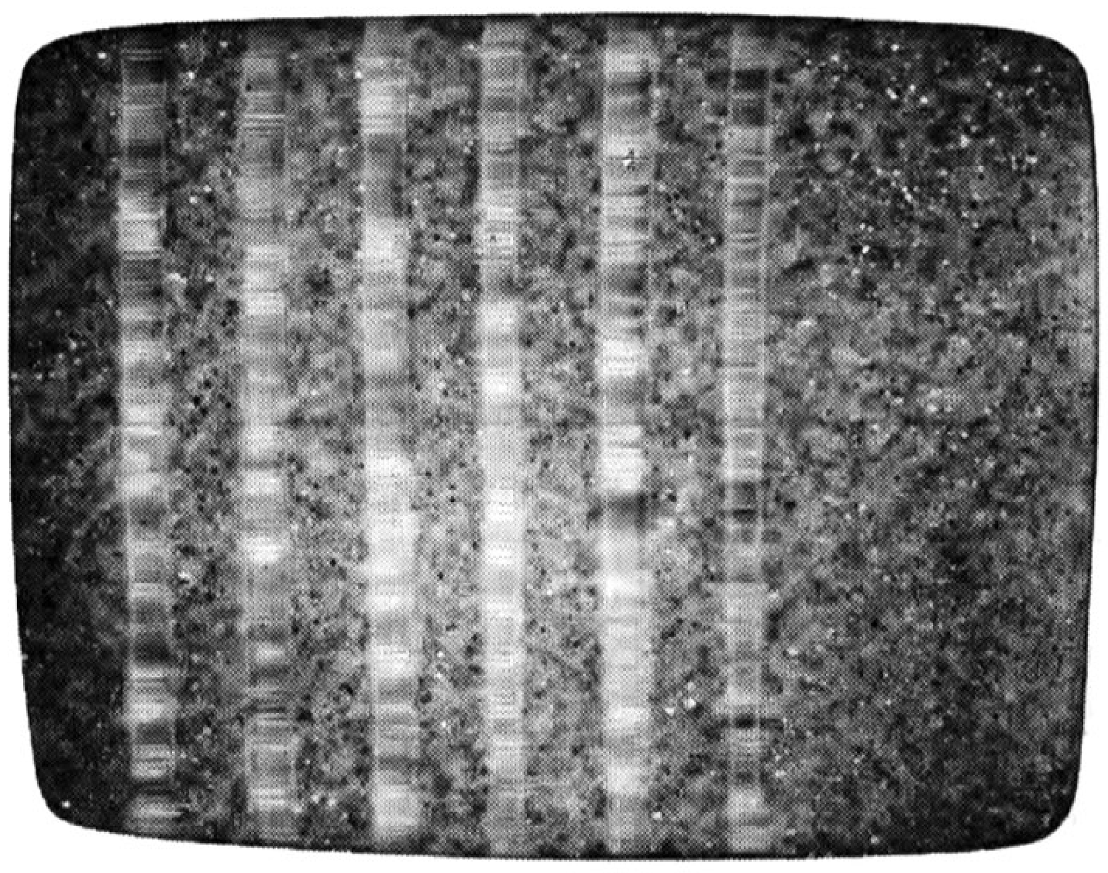
Note: Some noise may be sometimes made even when the VCR is used in LP mode. So be sure to set it to normal mode.

Tape is damaged if this kind of picture appears and cannot be corrected using tracking adjustment.

• Check of the unit

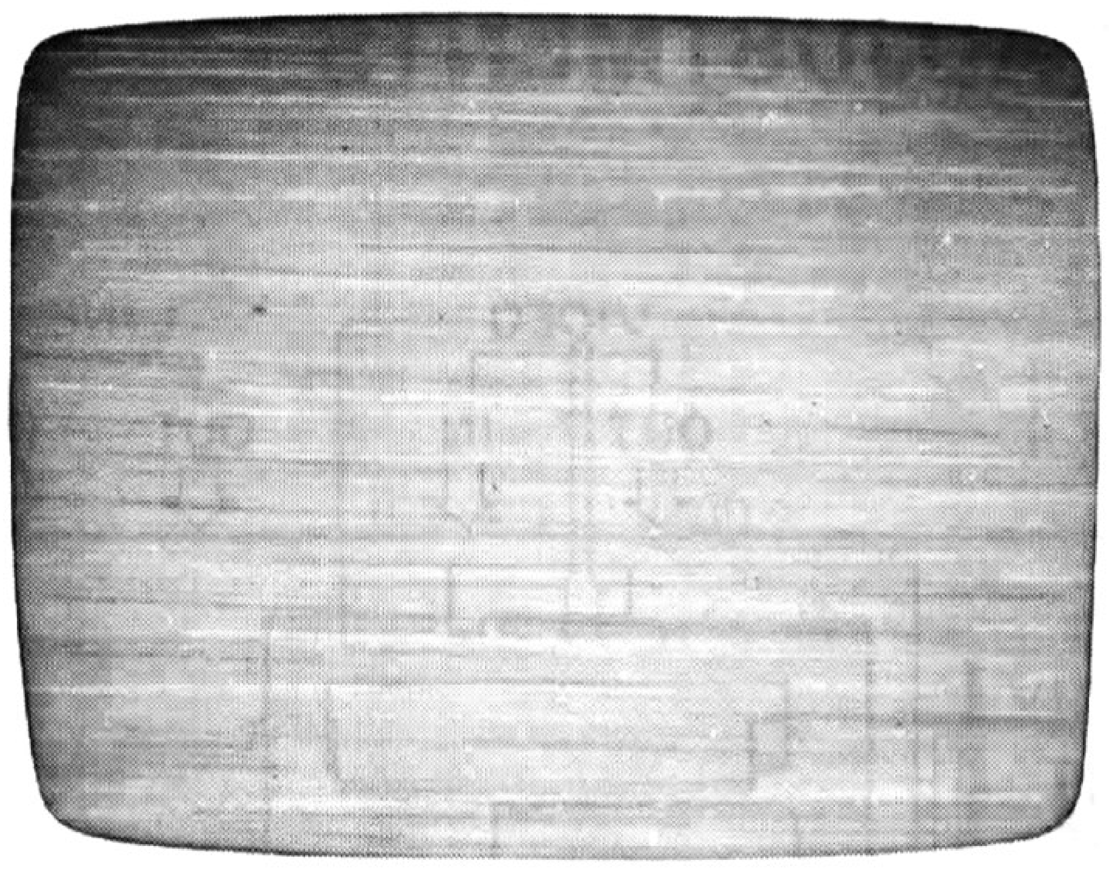
1. After PCM recording, play the video cassette on a TV.
2. If the picture is like **photo 1**, the tape is PCM-recorded, and normal. If it is like **photo 2**, the tape is not PCM-recorded and blank. The recording system may be defective.
3. If the picture is like **photo 3**, no signal is recorded on the tape. If this picture appears when the level indicator is deflected, the recording system of digital circuit may be defective. If this picture appears when the level indicator is not deflected, the recording system of analog circuit may be defective.
4. Check it by playing the PCM recorded video cassette tape.

Note: The rec-play selection of this unit is automatically made by detecting the input signal. therefore, make sure that the playback indicator on the front panel is ON during playback and OFF during recording before checking the playback or recording system as mentioned above.



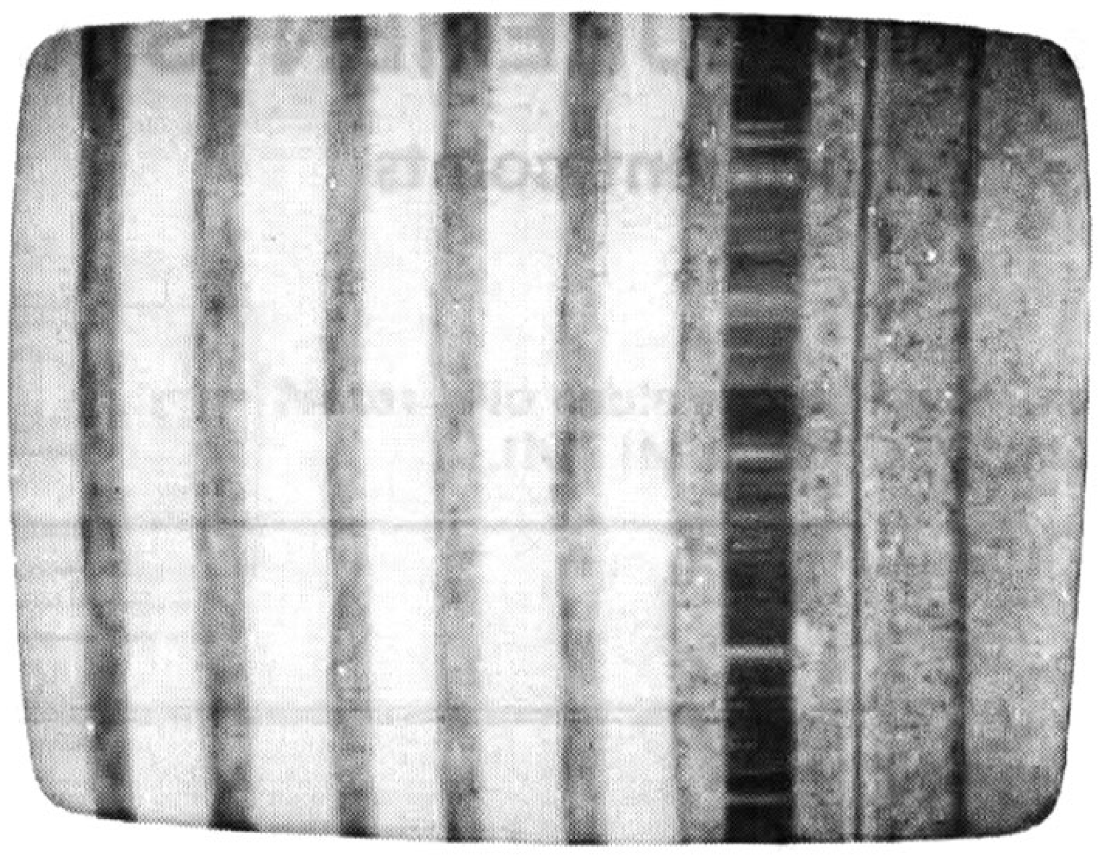
(Photo 1)

Tape is PCM-recorded, and normal. (Normal)



(Photo 2)

Tape is not PCM-recorded, and blank. (No recording)



(Photo 3)

Tape is PCM-recorded but no signal is recorded. (No signal)

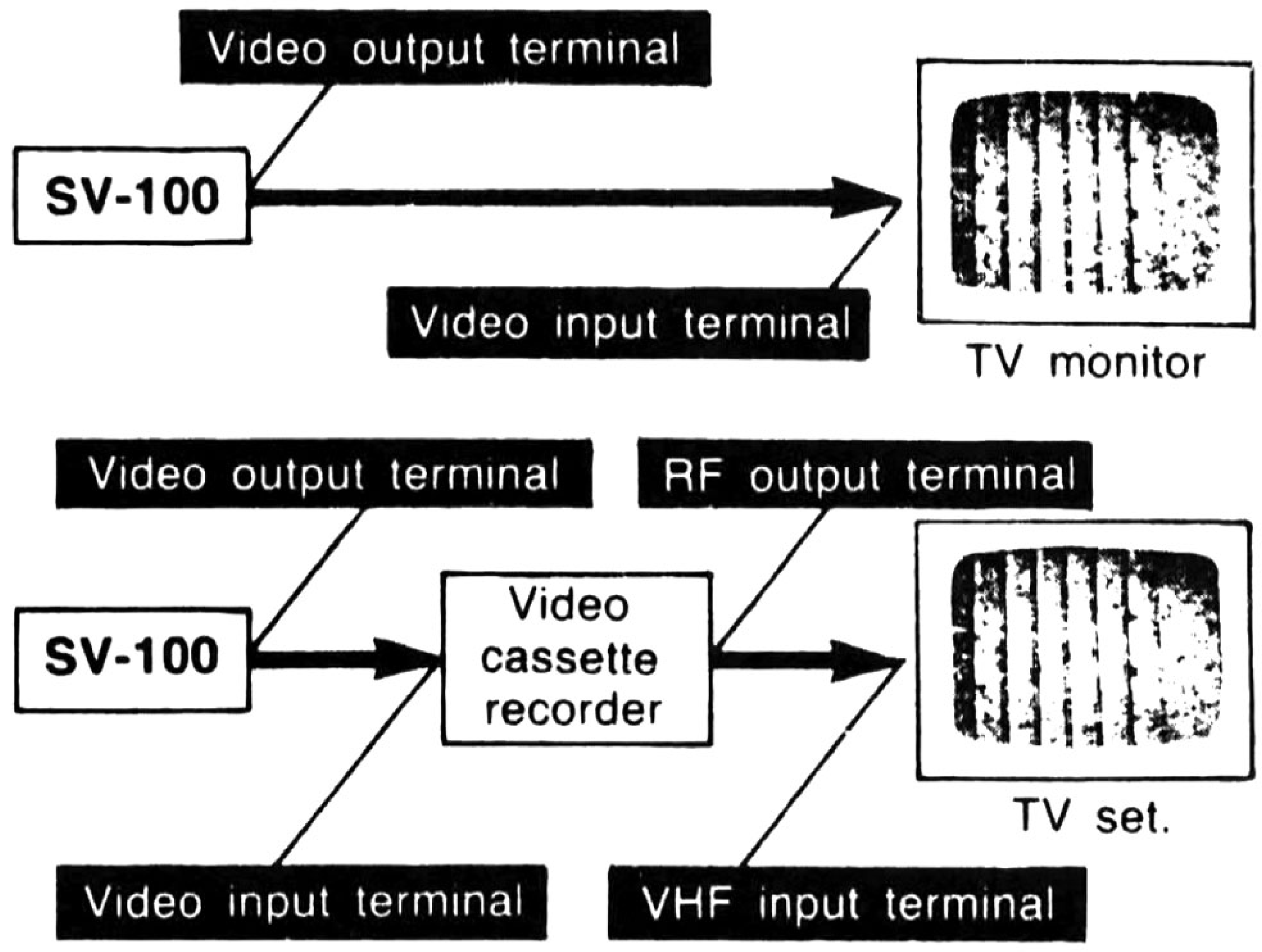
- **To check whether the SV-100 is recording properly:**

There are two connection methods that can be used to check whether this unit is recording signals properly.

[Procedure]

- Use the LINE IN or microphone input for the recording input signal.
- Adjust the recording level control of the SV-100 so the recording/playback level indicators rise and fall. At this time, the television screen should show the pattern shown above if the SV-100 is properly recording the input signal.

[How to connect]



■ ABOUT VIDEO CASSETTES AND RECORDERS

- **For best results, use the same VCR (video cassette recorder) for both recording and playback.**

The SV-100 is a digital audio processor. For PCM recording and playback, the SV-100 must be used with a VCR. VHS, Beta, and U-vision (or U-matic) type VCR's can all be used. However, new VCR models keep appearing on the market and there may be some that do not provide satisfactory performance in combination with this unit. Therefore, we recommend that you consult with your dealer and, if possible, try using the VCR with the SV-100 before making any buying decisions. For optimum results, the same VCR should be used for recording and playback.

- On the average, a typical video cassette tape can be used about 300 times (for recording and playback). If the same tape is used too many times, magnetic surface wear and tape stretch may interfere with normal playback. However, how many times a tape can be used depends on tape quality, VCR used, and the environment,
- Because video playback is seen by the human eye as a continuously moving picture, dropouts are rarely noticeable. However, in PCM recording and playback, dropouts can cause noise because they interfere with correct retrieval of the digital signal information. Of course, error correction circuitry and playback muting serve to minimize this problem. But the point is that tape quality is much more important for PCM recording and playback than it is for video.
- Therefore, for PCM recording it is recommended that you use the best quality video cassettes possible and if they are not new they should have been used only a few times.
- Clean the video heads from time to time. Good PCM recordings cannot be made if the heads are dirty.
- For best PCM recording and playback results, it is recommended that you use HG (high grade) VHS video cassettes.

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■ MEASUREMENTS AND ADJUSTMENTS

- **Adjustment points**

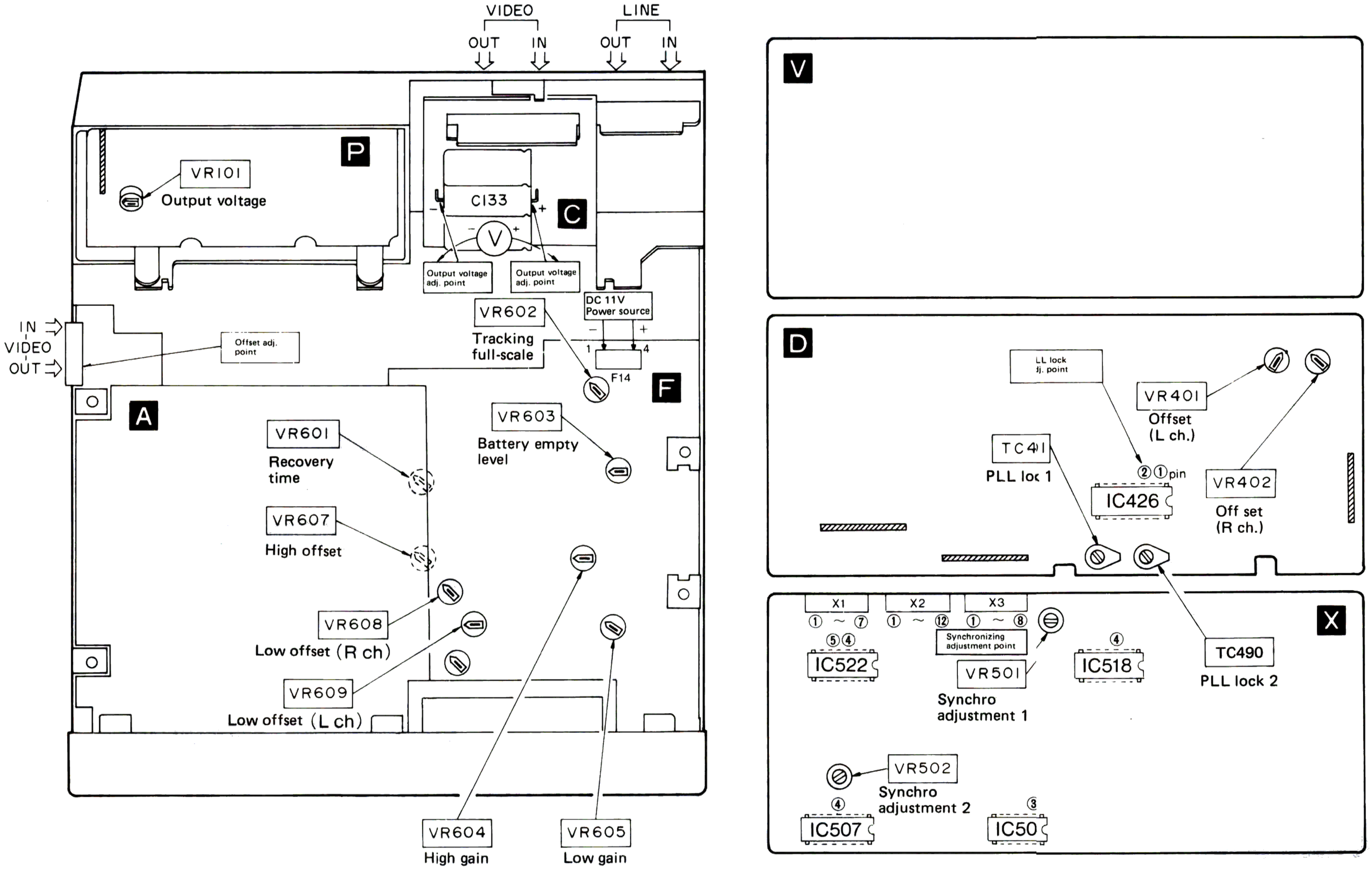
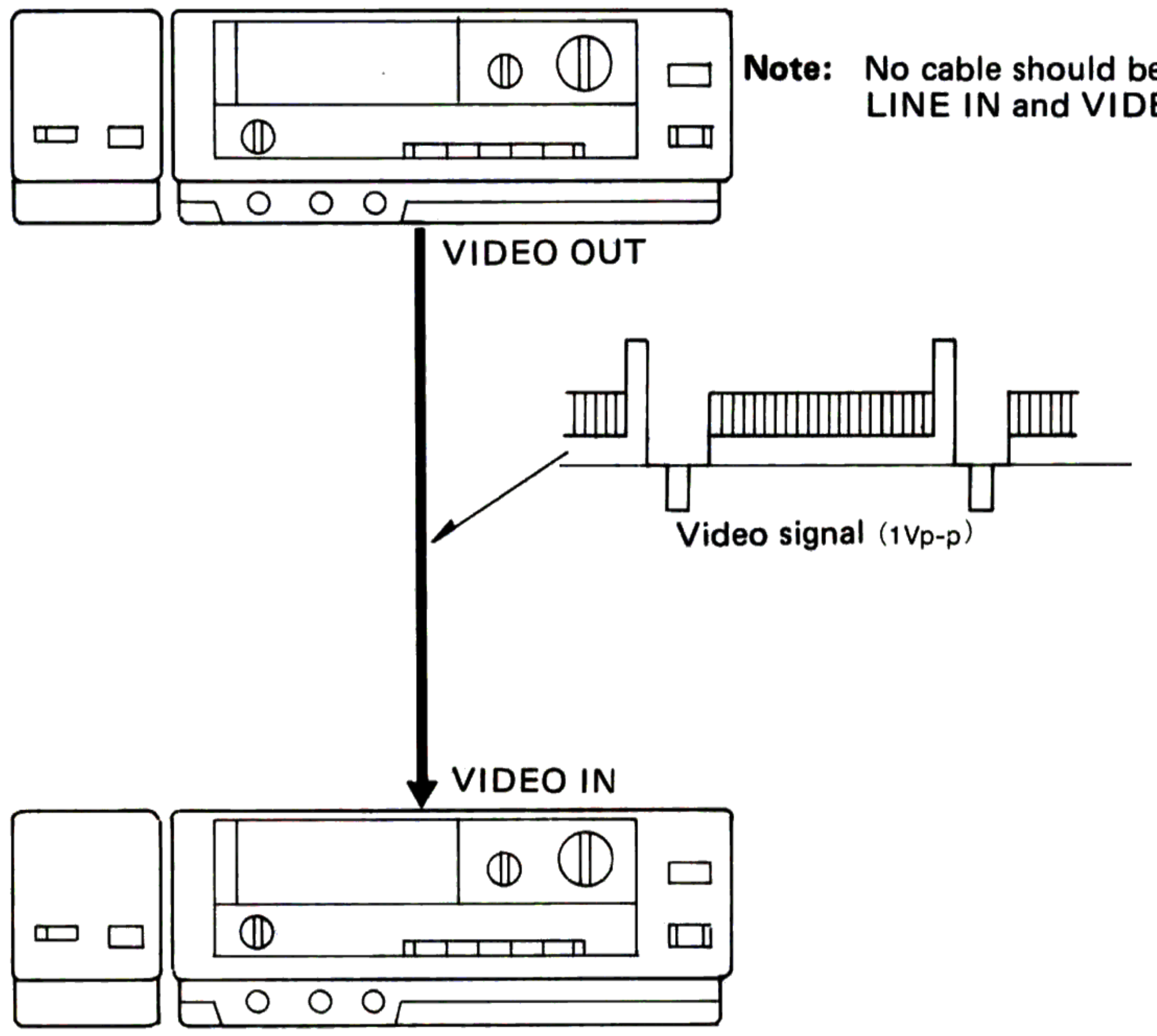


Fig. 16



Note: No cable should be connected to LINE IN and VIDEO IN terminals.

Fig. 19

- **Display**

Indicator selector . . . . . "level"

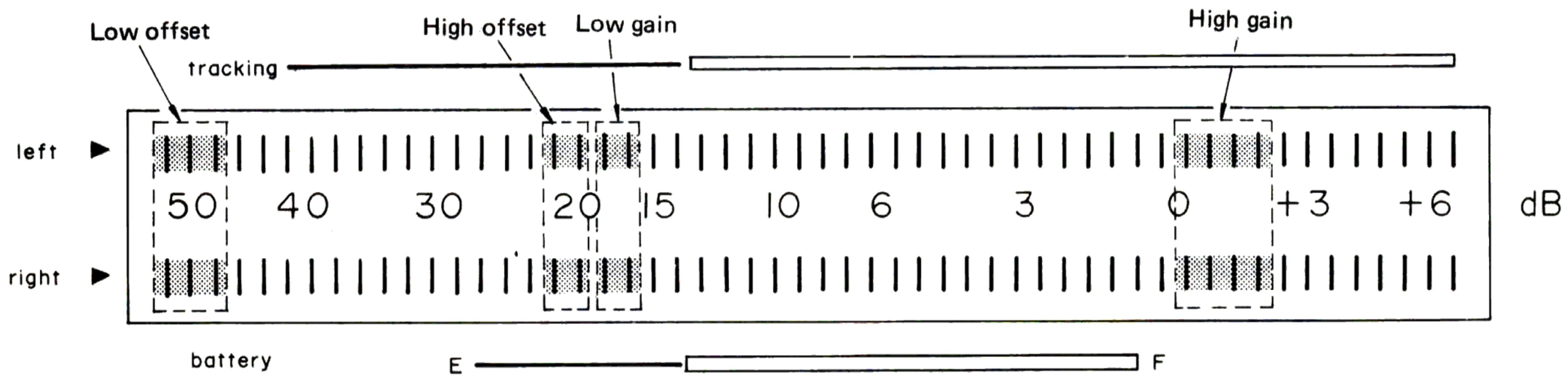


Fig. 17

Indicator selector. . . . . "tracking/batt"

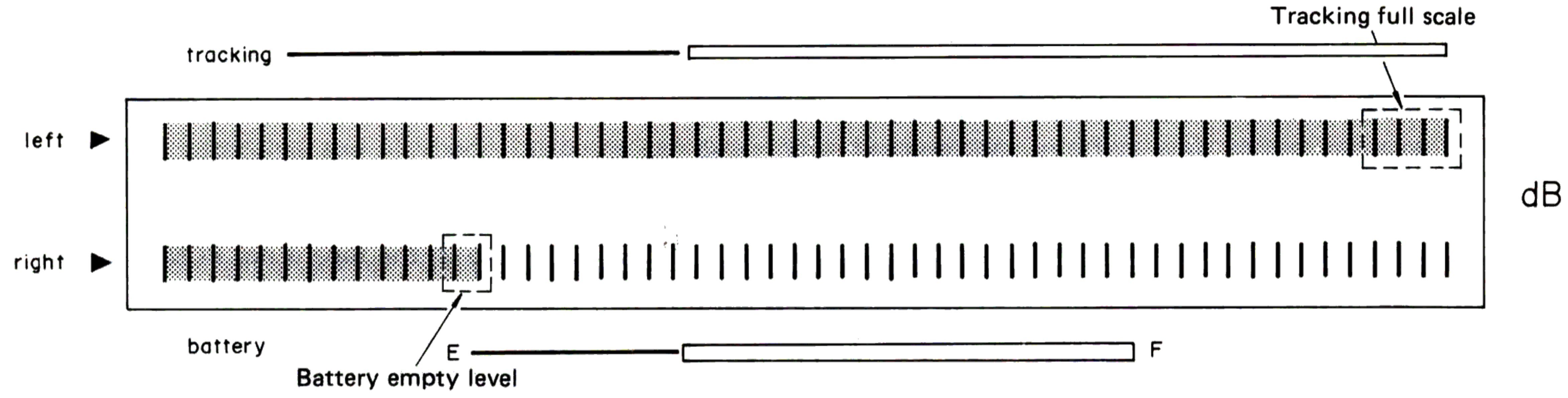


Fig. 18

1. Adjustment of output voltage (+5V)

After repair of the power supply circuit, adjust the output voltage according to the following procedure.

- **Instruments used and the condition of the set**

1. Electronic DC voltmeter.
2. Connect AC power unit to the main unit.
3. Connect the DC voltmeter to the terminals of C133. **(Fig. 16 : C P.C.B.)**

- **Adjusting procedure**

Adjust VR101 so that the voltage is 5.1V ± 0.1V a few minutes after power ON. **(Fig. 16 : P P.C.B.)**

2. Adjustment of display circuit

After repair of the display circuit, adjust the circuit according to the following procedure.

- **Instruments used and the condition of the set**

1. Electronic AC voltmeter.
2. 400 Hz sine wave oscillator.
3. DC power source (11V, 1A).
4. Connect AC power unit (SH-V100).
5. Recording level . . . . .maximum
6. Recording balance . . . . .center
7. Indicator select switch . . . . .level
8. Playback mode switch 1
9. Playback muting switch . . . . .auto
10. Connect 400 Hz sine wave oscillator to LINE IN.
11. Connect electronic AC voltmeter to LINE OUT.

Note: For the high offset, high gain and low gain, the adjustments on both right and left channels are simultaneously made by one variable resistor. Therefore, one of the right and left channel segaments of the display lights up and the other channel segment dims. Make the adjustment on the basis of the segment that dims.

Step	Item	Parts adjusted	Adjusting procedure
1	High offset **(Note)**	VR607	① Adjust input so that output of LINE OUT is 252 ± 1 mV. ② Adjust VR607 so that –19 dB segment of display dims. **(See Fig. 17)**
2	High gain **(Note)**	VR604	① Adjust input so that output at LINE OUT terminal is 2.25V. ② Adjust VR604 so that 0 dB segment of display dims. **(See Fig. 17)**
3	Low offset	VR608 (right channel) VR609 (left channel)	① Adjust input so that output at LINE OUT terminal is 8 mV. ② Adjust VR608 (right channel) and VR609 (left channel) so that –50 dB segment of display lights up. **(See Fig. 17)**
4	Low gain **(Note)**	VR605	① Adjust input so that output at LINE OUT terminal is 160 mV. ② Adjust VR605 so that –23 dB segment of display dims. **(See Fig. 17)**
5	Recovery time	VR601	① Adjust input so that output at LINE OUT terminal is 2.25V. ② Cut off the input instantaneously and check the falls of right and left channels of display. ③ If there is a difference between the falls, adjust VR601.
6	Tracking fullscale	VR602	① Set the indicator select switch to "tracking/batt". ② Connect VIDEO IN terminal to VIDEO OUT terminal of SV-100. ③ Adjust VR602 so that full-scale segment of left channel of display lights up. **(See Fig. 18)**
7	Battery empty level	VR603	① Pull out DC input terminal and connect DC power supply to battery terminal (F14). **(See Fig. 16 : F P.C.B.)** ② Adjust so that output of DC power supply is 11V. ③ Adjust VR603 so that E (battery) segment of right channel of display lights up. **(See Fig. 18)**

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3. Offset adjustment

After repair of digital circuit, adjust the offset according to the following procedure.

- **Instruments used and the conditions of the set**

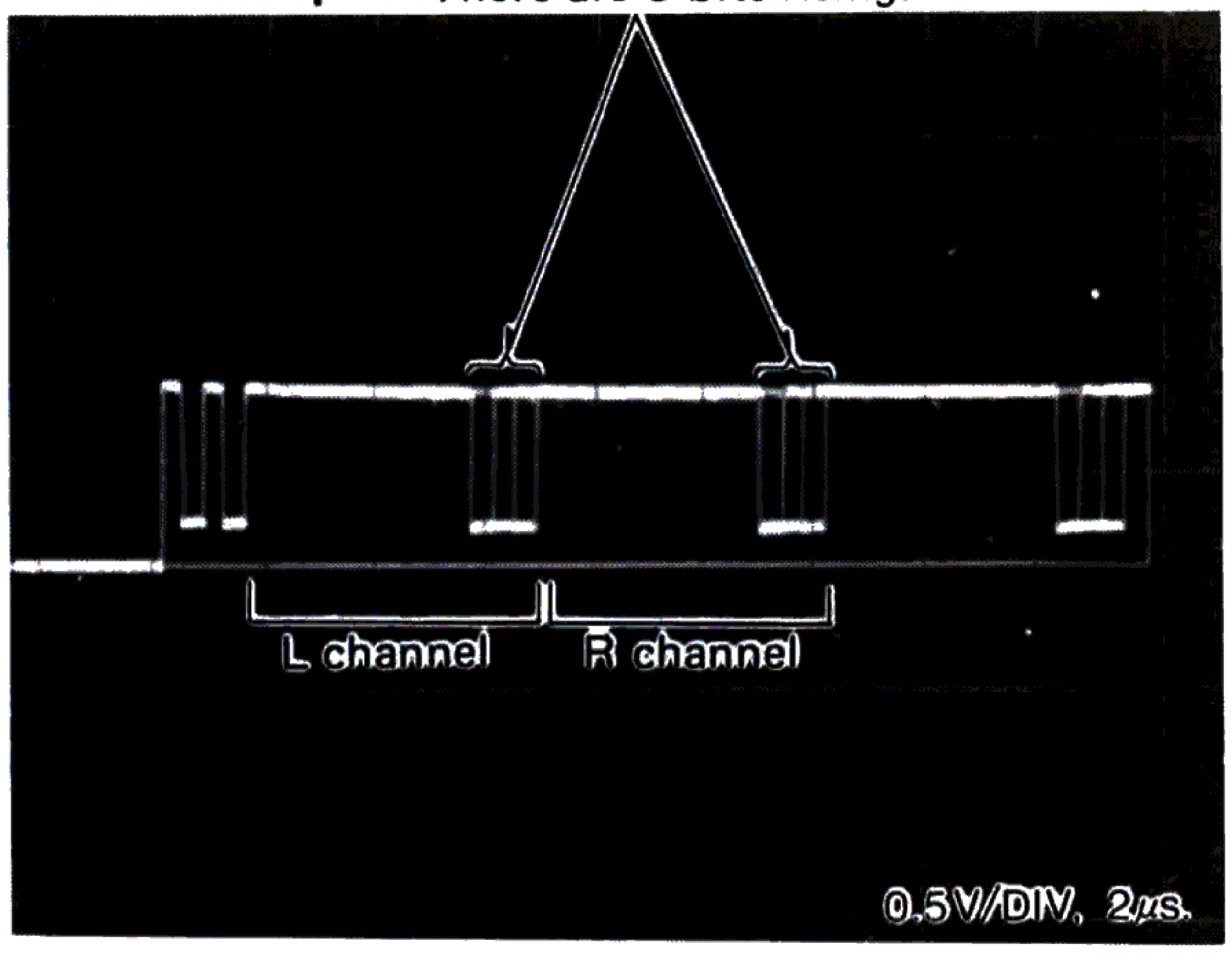
1. Oscilloscope (100 MHz).
2. Connect AC power unit (SH-V100).
3. Recording level . . . . .minimum.
4. Connect the oscilloscope to VIDEO OUT terminal.
5. Keep LINE IN terminal open.
6. Make sure that the set is in recording mode.
   (Playback indicator should light up.)

Note: If input is applied to VIDEO IN terminal, the circuit is automatically shifted to playback mode.

- **Adjustment procedure**

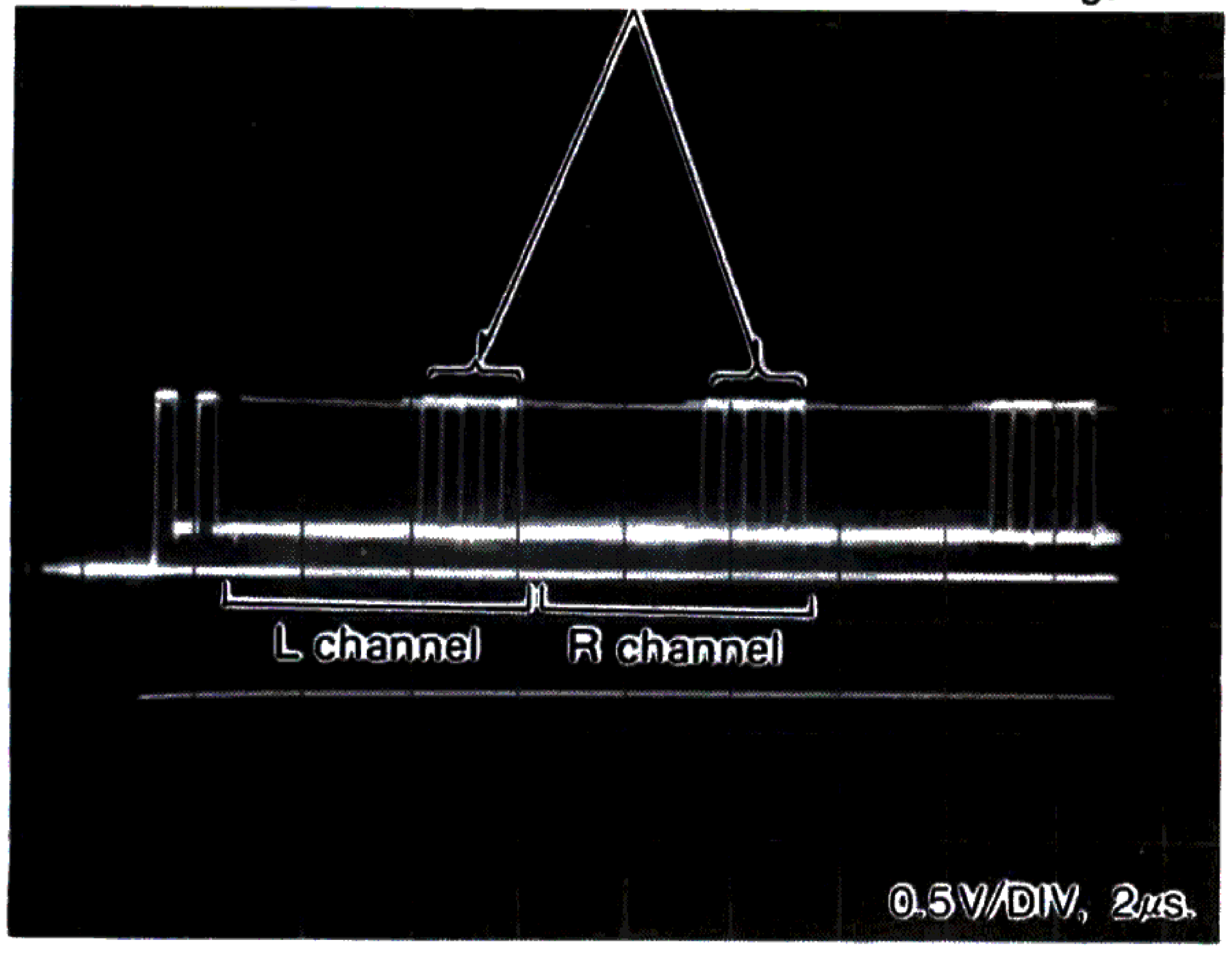
Adjust VR401 (left channel) and VR402 (right channel) so that there are 3 bits from the last bit (LSB) of right/left channel of video output waveform. **(See photo 4, 5)**

- **Good example** There are 3 bits rising.



(Photo 4)

- **Bad example** There are more than 3 bits rising.



(Photo 5)

4. PLL lock adjustment

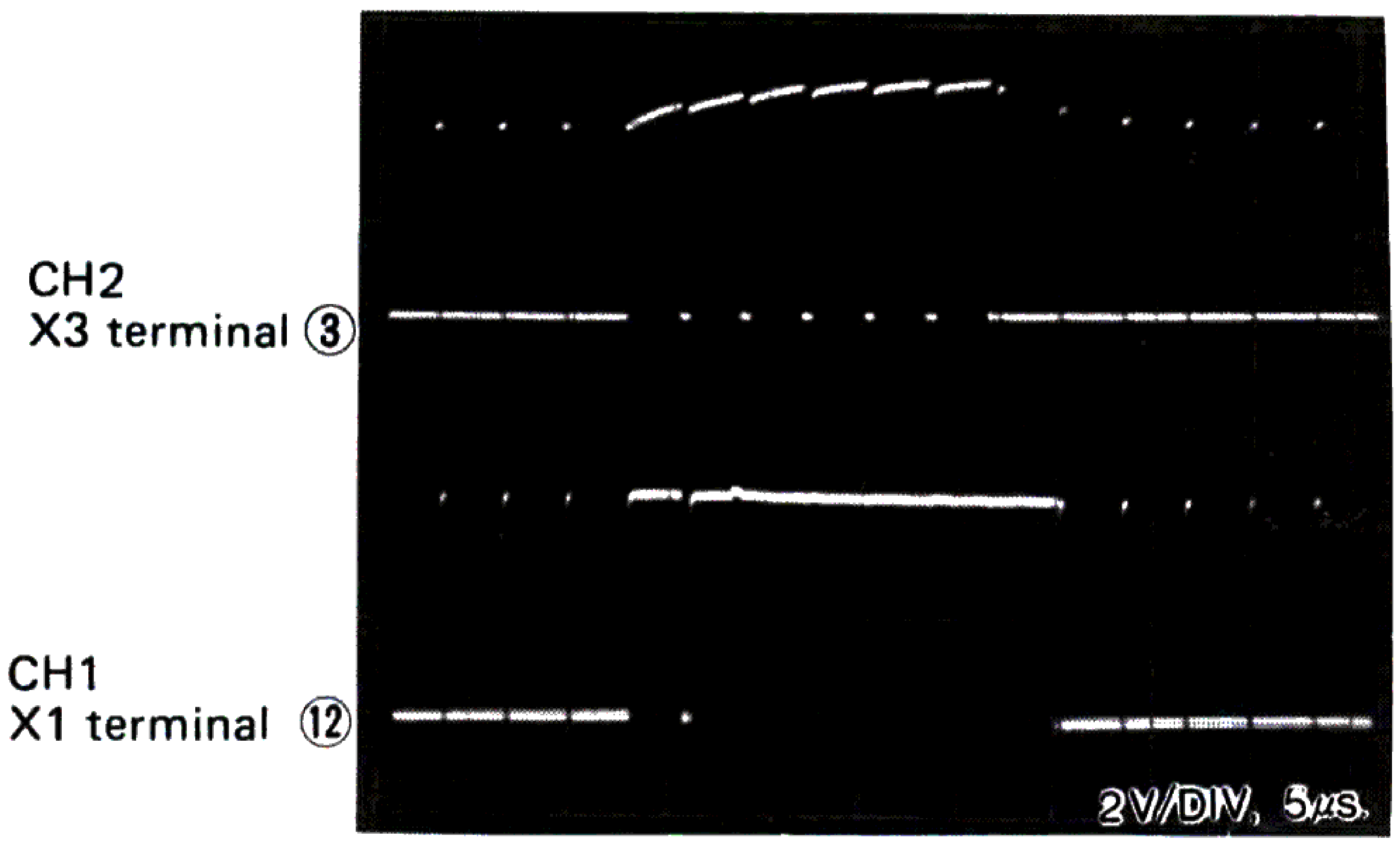
After repair of digital circuit, adjust the PLL lock according to the following procedure.

- **Instruments used and the condition of the set**

1. Electronic DC voltmeter.
2. Video deck or home VCR.
3. Connect AC power unit (SH-V100).
4. Connect the video input terminal, and play the recorded tape.
5. Make sure that the set is in playback mode.
   (The playback indicator should light up.)

- **Adjusting procedure**

1. Connect electronic DC voltmeter to terminal ① of IC426.
2. Adjust TC401 so that DC voltmeter is 2.5V ± 0.1V . . . . PLL lock adjustment 1.
3. Connect electronic DC voltmeter to terminal ② of IC426.
4. Adjust TC490 so that DC voltmeter is 2.5V ± 0.1V . . . . PLL lock adjustment 2.



(Photo 6)

5. Synchronizing circuit adjustment

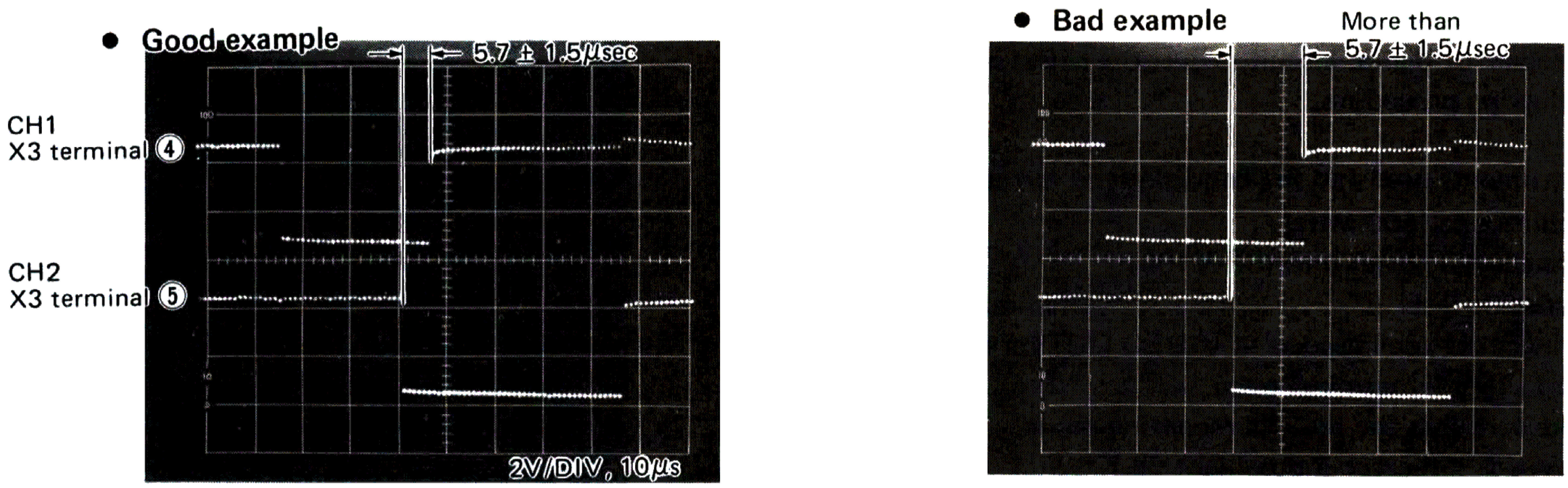
After repair of synchronizing circuit, adjust the circuit according to the following procedure.

- **Instruments used and the condition of the set**

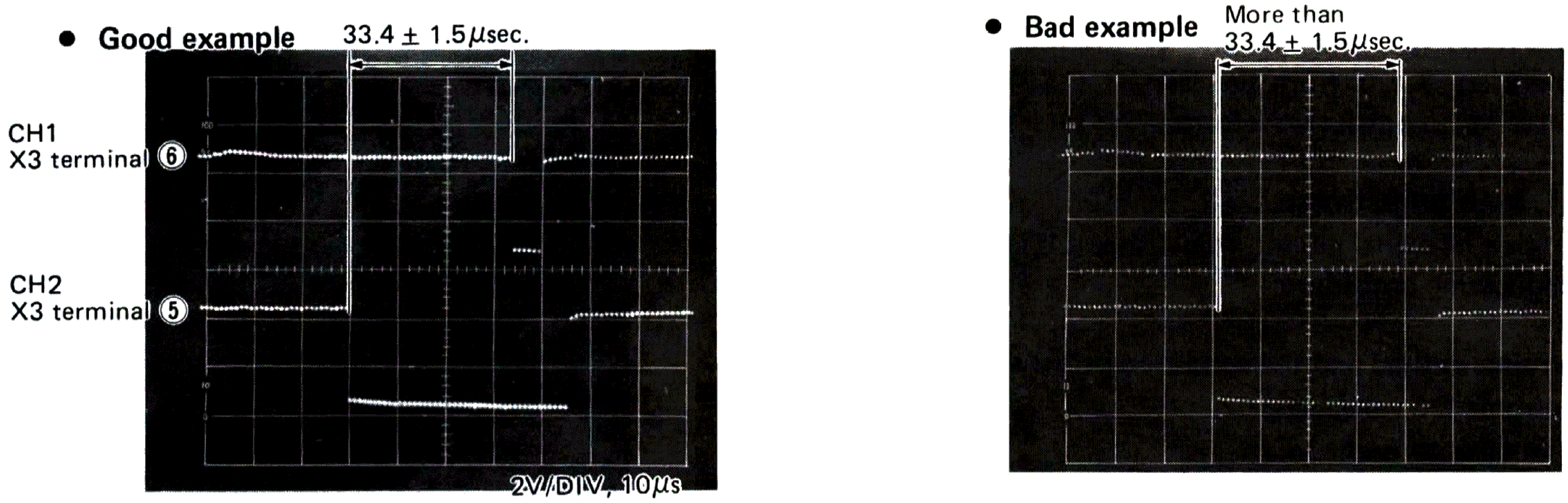
1. Two-channel oscilloscope (100 MHz with delay).
2. TV SG or SV-100, SV-P100.
3. Connect AC power unit.
4. Connect VIDEO OUT and DIGITAL OUT terminals of TV SG (output 75 ohms, 1Vp-p) or SV-100 and SV-P100 to VIDEO IN terminal. **(See Fig. 19)**
5. Make sure that the set is in playback mode.
   (The playback indicator should light up.)

- **Adjusting procedure**

1. Completely turn VR501 counterclockwise, and VR502 clockwise.
2. Connect CH1 and CH2 of oscilloscope to connector X1 terminal ⑫ (IC505 terminal ③) and connector X2 terminal ③ (IC522 terminal ⑤).
3. Make sure that the waveform of each photo is like **photo 6.**
4. Connect CH1 and CH2 of oscilloscope to connector X3 terminal ④ (IC518 terminal ④) and terminal ⑤ (IC522 terminal ④).
5. Adjust VR501 so that the waveform of each terminal is like **photo 7.**
   . . . . Synchro adjustment 1 (VSC)
6. Connect CH1 and CH2 of oscilloscope to connector X3 terminal ⑥ (IC507 terminal ④) and terminal ⑤ respectively.
7. Adjust VR502 so that the waveform of each terminal is like **photo 8.**
   . . . . Synchro adjustment 2 (V8)

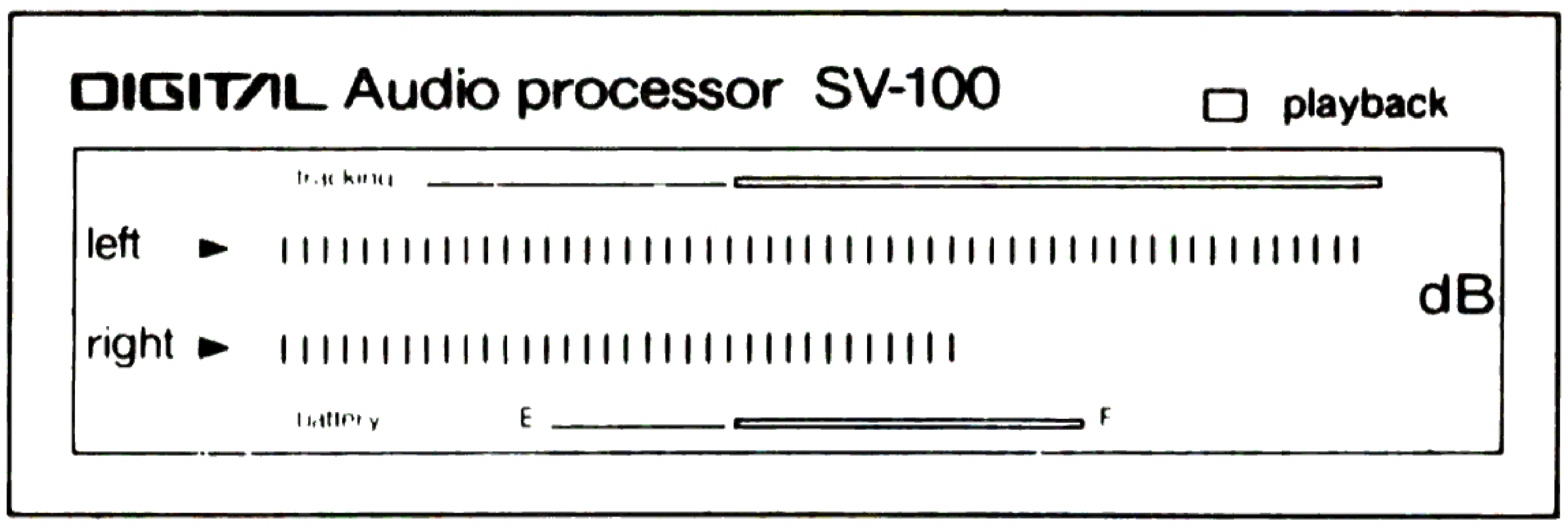


(Photo 7)



(Photo 8)

6. Video tracking adjustment



Watch the indication on the left channel section of the display panel and switch the playback mode back and forth between "1" and "2", while gradually turning the VCR's tracking adjustment, knob back and forth. Select the playback mode and VCR tracking knob setting that gives the furthest indications to the right.

- Optimum results are obtained if the indication reaches all the way into the orange section; however, you can still enjoy satisfactory playback if indication remains in the blue section. Tracking is poor if indication does not reach the blue section.

Note:

- If you cannot obtain good tracking by adjusting the VCR's tracking control and selecting optimum playback mode, the VCR's heads may be dirty or the cassette tape may be damaged. In this case, clean the video heads or try using a different cassette.
- When tracking is poor, playback muting will operate often, interrupting the playback sound; static-like noise may also occur.
- In extremely rare cases, noise may occur even if tracking is good. This is not necessarily a malfunction, it means that the limits of error correction function capability have been exceeded.
  To minimize the chances of such a problem, take good care of your VCR and video cassettes.

■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "Ⓢ" mark is service standard parts and may differ from production parts.
5. The perenthesized numbers in column of description stand for the quality per set.

Areas

- * [E] is available in Switzerland and Scandinavia.
- * [EK] is available in United Kingdom.
- * [EG] is available in F.R. Germany.
- * [EB] is available in Belgium.
- * [EH] is available in Holland.
- * [EF] is available in France.
- * [Ei] is available in Italy.
- * [XL] is available in Australia.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.

• Main unit

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	SVIUPC494C	Power Supply OSC Control
IC151,152,155,157	SVINJM4559DS	Mic Amp,Pre-emphasis,Buffer
IC153,156	SVIUPD4066BC	Quad Bilateral Switch
IC154	SVITL082CP	Buffer
IC158,159	SVILA4140A	Phones Amp.
IC160	AN6914	Comparator
IC301	MN1400PCA	Slice Level Control
IC302,304	SVIHD74LS123	Multivibrator
IC303	SVIHD74LS74P	D-Type Flip Flop
IC305	SVIHD74LS00P	2-Input Positive NAND Gate
IC307	SVITC4001BP	2-Input Positive NOR Gate
IC308,309	SVITL082CP	Operational Amp.
IC310	AN6552F	Comparator
IC311,314	AN6914	Comparator
IC312,313	SVILM360N	Comparator
IC401,402,406	SVITL081CP	Operational Amp.
IC403,407,410	SVITL082CP	Operational Amp.
IC404,405,409	SVIUPD4066BC	Quad Bilateral Switch
IC411	EHKMA6196	A-D/D-A Converter
IC412,420	SVIHD74LS126	Buffer
IC413,415	SVIHD74LS74P	D-Type Flip Flop
IC414	DN74LS04	Inverter
IC416	MN6603	REC/PB Control
IC417	MN6601	Recording LSI
IC418,419,424,425	SVIHM6116P-4	RAM
IC421	SVIHD74LS86P	2-Input Exclusive OR Gate
IC422	SVIHD74LS00P	2-Input Positive NAND Gate
IC423	MN6602	Playback LSI
IC426	SVISN74LS629	Voltage-Controlled OSC
IC427	SVITC5081AP	Phase-Controlled Comparator
IC428	SVIHD74LS174	D-Type Flip Flop
IC481,486	SVIHD74LS123	Multivibrator
IC482	SVIHD74LS74P	D-Type Flip Flop
IC483,485	SVIHD74LS02P	2 Input NOR Gate
IC484	SVIHD74LS161	4-Bit Binary Counter
IC492	SVITC5081P	Phase-Controlled Comparator
IC493,495	SVIHD74LS123	Multivibrator
IC494	SVIHD74LS125	Buffer Gate
IC496,497	SVIHD74LS174	D-Type Flip Flop
IC501	SVITC5081AP	Phase-Controlled Comparator
IC502,513,519,520	SVIHD74LS74P	D-Type Flip Flop
IC503,506,507,508 515,517,518	SVISN74LS123	Multivibrator
IC504	DN74LS08	2-Input AND Gate

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC505	SVIHD74LS32P	2-Input OR Gate
IC509	SVIUPD4066BC	Quad Bilateral Switch
IC510	SVIHD74LS00P	2-Input NAND Gate
IC511	SVIHD74LS11P	3-Input AND Gate
IC512,521	DN74LS02	2-Input NOR Gate
IC514	SVIHD74LS161	4-Bit Binary Counter
IC516	SVITC40H004P	Inverter
IC522	DN74LS14	Inverter
IC601	AN6552F	Operational Amp.
IC602	AN6562	Operational Amp.
IC603,604	SVINJM082D	Operational Amp.
IC605,606	AN6870N	FL Drive
IC607	SVIUPD4066BC	Quad Bilateral Switch
IC608	SVITC4011BP	2-Input NAND Gate
TRANSISTORS		
Q101	2SD1271-Q	Switching
Q102	2SB643	Amplitude Expander
Q103,104,105	2SD636	Switching
Q106	2SB641	Switching
Q151,152,159	2SD636	Muting & Relay Drive
Q153,154,155,156 165	2SB641	Switching
Q157,158	2SD636	Switching
Q160 Ⓢ	2SC1328-T	Relay Drive
Q161~164	2SC2385-G	Mic Amp.
Q301,304	2SC2377	Buffer
Q302,303,305,306 309,318,322,323	2SD636	Buffer&Switching
Q307,308,310,319	2SB641	Buffer&Switching
Q311	2SK301	Switching
Q401,402,406,407 412,413	2SD636	Switching
Q403,408,414,415 417	2SB641	Switching
Q404,405	2SD636	Switching
Q409	2SK301	Switching
Q501,502	2SB641	Switching
Q503	2SD636	Switching
Q601~604,607	2SD636	Buffer&Switching
Q605,606	2SD637	Switching
Q608	2SB641	Switching
Q609	2SB642	Switching
Q611,612	2SK301	Input Amp
DIODES		
D101,107	MA2240	Zener,24V
D102~105	SVDS2K20H	Rectifier
D106	SVDS3S3M	Rectifier
D108,109 Ⓢ	MA162A	Bias
D110	MA1100	Zener,10V

Ref. No.	Part No.	Description
DIODES		
D131	SVDPR5531K	Rec Muting Indicator
D132	SVDPG5531KY	Playback Indicator
D140	SVDERC81004H	Switching
D151~159 Ⓢ	MA162A	Bias
D301~304, 308,309, 311,313~316 Ⓢ	MA162A	Switching
D306 Ⓢ	MA1051	Zener,5.1V
D312,401	MA26T0-A	Switching
D402	0A90A	Switching
D403 Ⓢ	RVDRD7R5FB	Zener,7.5V
D404~406 Ⓢ	MA162A	Switching
D407	MA1150	Zener,15V
D408~412 Ⓢ	MA162A	Switching
D481 Ⓢ	MA162A	Switching
D515 Ⓢ	MA162A	Switching
D601,602,607, 609,610 Ⓢ	MA162A	Switching
D603 Ⓢ	RVDRD7R5FB	Zener,7.5V
D604 Ⓢ	MA1056	Zener,5.6V
Q605,606,608, 613~617	0A90A	Switching
D611,612	MA1150	Zener,15V
CRYSTAL		
X401	SVQ18C1575	15.75MHz Counter OSC
COILS and TRANSFORMERS		
L101	SLQ1204T300A	Line Filter
L102	SLQT10-100	Choke
L103~105	SLQT10-121	Choke
L106	ELET271KA	Choke
L107	SLQT10-560	Choke
L108	SLT12K10A	Base Drive Transformer
L109 ⚠	SLT28K2A	Switching Transformer
L151,152	ELET102KA	Line Filter
L301	ELB5F7	Low Pass Filter
L302,303	ELB5F043	Delay Line
L304~306	SLQ0930T300C	Balun
L601,602	ELET102KA	Choke
LPF151,152	EULBPF304	Low Pass Filter
VARIABLE RESISTORS		
VR101	EVM38GA00B14	Output Voltage Adjustment, 10kΩ(B)
VR201	EWCXGA001A15	Rec Level, 100kΩ(B)
VR202	EWGHFA053375	Rec Balance,
VR203	EVJRCA014AF5	Phones Level
VR401,402	EVN38CA00B24	Offset Adjustment, 20kΩ(B)
VR501,502	EVMG0GA01B54	Synchro adjustment, 50kΩ(B)

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• Main unit

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR601	EVN38CA00B16	Recovery Time Adjustment, 1MΩ(B)
VR602	EVN38CA00B24	Tracking Full-scale Adjustment, 20KΩ(B)
VR603	EVN38CA00B23	Battery Empty Level Adjustment, 2KΩ(B)
VR604～606	EVN38CA00B14	High Gain,Low Gain,+16V Adjustments, 10KΩ(B)
VR607	EVN38CA00B15	High Offset Adjustment, 100KΩ(B)
VR608,609	EVN38CA00B25	Low Offset Adjustment, 200kΩ(B)
VARIABLE CAPCITOR		
TC401,490	ECVIZW50X32E	Trimmer,PLL Lock Adjustment
FLUORESCENT DISPLAY TUBE		
FL601	SSDQBG124Z	Level & Tracking /batt
RELAY		
RLY151	SSDYAG2223	Muting
SWITCHES		
S601 ⚠	ESB6612	Power
S602	EVQQJR02K	REC Muting
S603～605	ESD14184	Indicator,Playback Mode and Playback Muting Switches

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1	SSAC101N01A	Front Panel Ass'y (1)
2	SBN1085-4	Knob,Phones Level & Rec Blance (2)
3	SSKT101N03	Knob,Rec Level (1)
4	VGT0272	Knob,Indicator,Playback Mode & Playback Mute (3)
5	SSKT101N01E	Button,Rec Muting (1)
6	SSQA101N01	Spring,Rec Muting Button (1)
7	SSKT101N02	Button,Power (1)
8	SSAC101N04E	Cabinet Ass'y (1)
9	VGU0497	Button,Batt Eject (1)
10	VMB0967	Spring,Batt Eject Button (1)
11	SSGZ101N01	Rubber,FL (2)
12	VMSS0277	Bracket,Shoulder Strap (2)
13	VGKS0430	Ornament,Left (1)
14	VGKS0427	Ornament,Right (1)
15	SSAC101N03	Bottom Board (1)
16	VMG0211	Foot (4)
17	SSUM101N05	Bracket,P.C.B (1)
18	SSUM100N27	Clamper,Lead Wier (1)
19	SSUM101N08	Latch (2)
20	SSNP101N01	Plate (1)
21	SJF3207-4N	Terminal,VIDEO IN/OUT (1)
22	SJF3431-7SN	Terminal,LINE IN/OUT (1)
23	SJF3431-8N	Terminal,VIDEO IN/OUT&COPY OUT (1)
24	SSDK101M01	Socket,DIN(DC12V) (1)
25	SSUP101N10	Bracket,DIN Socket (1)
26	SSUP101P01	Bracket,Terminals (1)
27	SSAC101N02	Rear Panel (1)
28	SSUM101N07	Clamper,Lead Wire (1)
29	SSUM101N04	Battery Case (1)
30	VJF0144	Terminal,Battery (1)
31	VMB0969	Spring,Battery Eject (1)
32	VGQ0273	Stopper,Battery (1)
33	VGU0312	Plate,Stoper (1)
34	VMB0968	Spring,Stoper (1)
35	VMA4972	Bracket,Stopper (1)
36	VKF0111-1	Battery Cover (1)
37	VMS2135-1	Shaft,Battery Cover (1)
38	VMB0966-1	Spring,Battery Cover (2)
39	VKC0051	Hinge (1)
40	VMA5799	Plate,Hinge (1)
41	SSNN101P02	Name Plate (1)
42	SSDJ2317010	Jack,Mic (2)
43	SSDJ2317020	Jack,Head Phones (1)
45	SSUZ101N10	Spacer,Battery Eject Button (1)
46	SSUM100N24	Spacer, (1)
47	SFGZQ11N01	Spacer,Rec Mute LED (1)
48	SSKK101N01	Filter,FL (1)
SCREWS		
N1 Ⓢ	XTV3+8BFN	Screw,⊕3×8 (6)
N2 Ⓢ	XTV3+6BFN	Screw,⊕3×6 (17)
N3 Ⓢ	XTN3+8BFZ	Screw,⊕3×8 (5)
N4 Ⓢ	XTN3+6B	Screw,⊕3×6 (6)
N5	SSXG101N01	Screw, (2)
N6 Ⓢ	XTB3+6BFZ	Screw,⊕3×6 (2)
N7 Ⓢ	XTV3+18BFN	Screw,⊕3×18 (2)
N8 Ⓢ	XSS17+4FZ	Screw,⊕17×4 (2)
N9 Ⓢ	XSN26+4FZ	Screw,⊕26×4 (2)
N10	SFXG212-03	Screw (2)
WASHERS		
N14 Ⓢ	XWG3FZ	Washer, φ3 (4)
N15 Ⓢ	XWA26BFZ	Washer, φ26 (2)
N16	SSXW101N01	Washer (2)
NUTS		
N17 Ⓢ	XNS8	Nut, φ8 (2)
N18 Ⓢ	XNS7	Nut, φ7 (1)
N19	SSXN101N01	Nut (2)

Ref. No.	Part No.	Description
NUTS		
N20 Ⓢ	XNS12	Nut, φ12 (1)
CONNECTORS		
❶	SSDJ101N01E	COnnector Ass'y, BT151←→JA3 (1)
❷	SSDJ101N02E	Connector Ass'y, F3←→[S W] P.C.B (1)
❸	SSDJ101N03E	Connector Ass'y, F18←→[R M] P.C.B (1)
❹	SSDJ101N04E	Connector Ass'y, A2→[P L] P.C.B (1)
❺	SSDJ101N05E	Connector Ass'y, F13←→BT152 (1)
❻	SSDJ101N06E	Connector Ass'y, F6←→[C] P.C.B. (1)
❼	SSDJ101N07E	Connector Ass'y, F8←→BT108 (1)
❽	SSDJ101N08E	Connector Ass'y, F15←→[P] P.C.B. (1)
❾	SSDJ101N09E	Connector Ass'y, C3←→[P] P.C.B. (1)
❿	SSDJ101N10E	Connector Ass'y, C1←→BT404 (1)
⓫	SSDJ101N13E	Connector Ass'y, JA5←→A8 (1)
⓬	SSDJ101N14E	Connector Ass'y, F5,12←→BT208 (1)
⓭	SSDJ101N15E	Connector Ass'y, F7←→BT206 (1)
⓮	SSDJ101N16E	Connector Ass'y, F1←→BT205 (1)
⓯	SSDJ101N17E	Connector Ass'y, F12←→BT209 (1)
⓰	SSDJ101N19E	Connector Ass'y, A6←→BT301 (1)
⓱	SSDJ101N20E	Connector Ass'y, JA2←→BT304 (1)
⓲	SSDJ101N21E	Connector Ass'y, F17←→BT307 (1)
⓳	SSDJ101N22E	Connector Ass'y, D2←→BT306 (1)
⓴	SSDJ101N23E	Connector Ass'y, D1←→BT302 (1)
21	SSDJ101N24E	Connector Ass'y, D3←→BT303 (1)
22	SSDJ101N25E	Connector Ass'y, X2←→BT305 (1)
23	SSDJ101N27E	Connector Ass'y, V308←→BT401 (1)
24	SSDJ101N28E	Connector Ass'y, F2←→BT403 (1)
25	SSDJ101N29E	Connector Ass'y, X1←→BT402,406,407 (1)
26	SSDJ101N30E	Connector Ass'y, C1←→BT404 (1)
27	SSDJ101N31E	Connector Ass'y, A3←→BT405 (1)
28	SSDJ101N32E	Connector Ass'y, A5←→JA4 (1)
29	SSDJ101N33E	Connector Ass'y, A1←→BT202,203 (1)
30	SSDJ101N35E	Connector Ass'y, A4←→BT204 (1)
31	SSDJ101N36E	Connector Ass'y, A7←→BT207 (1)
32	SSDJ101N41A	Connector Ass'y, F10←→F20 (1)
33	SSDJ101N42A	Connector Ass'y, F11←→F21 (1)
34	SSDJ101N43A	Connector Ass'y, F9←→F19 (1)
35	SSDJ101N11E	Connector Ass'y, F4←→[S W] P.C.B. (1)
36	SSDJ101N34E	Connector Ass'y, JA1←→V309 (1)
37	SSDJ101N50E	Connector Ass'y D11←→BT409 (1)

• AC power unit

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC701	SVIUPC305C	Reference Voltage
IC702	AN6914	Charging Det.
TRANSISTOS		
Q701	2SD1110	Power
Q702	2SB761	Driver
Q703,704,707	2SB641	Switching & LED Drive
Q705,706	2SD636	Charging Mode Det.
DIODES		
D701 ⚠	SVDS5VB10	Rectifier
D703,706 Ⓢ	MA162A	Rectifier
D704,705	SVDPR5531K	Power & Charging Indicator
THERMISTOR		
TH701	ERTD2FHL332S	3.3kΩ
VARIABLE RESISTOR		
VR701	EVN38CA00B13	Output Voltage Adj.,1kΩ(B)
SWITCHES		
S701	ESD14184	Recording Selector
S702 ⚠	ESB827S	Power
S703 ⚠	ESE37200	Voltage Selector
TRANSFORMER		
T701 ⚠	SLT66PE267E	Power Transformer
FUSES		
F701 ⚠	XBA2C10TR0	T1A,250V
F702 ⚠	XBA2C20TR0	T5A,250V

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Ref. No.	Part No.	Description	
PACKING PARTS			
P1〔EF〕	SSHP101C01	Carton Box	(1)
P1〔other areas〕	SSHP101M01	Carton Box	(1)
P2	SSHH101N01	Pad,Front Upper Side	(1)
P3	SSHH101N02	Pad,Front Lower Side	(1)
P4	SSHH101N03	Pad,Rear Upper Side	(1)
P5	SSHH101N04	Pad,Rear Lower Side	(1)
P6	SSHD101N01	Parts Box,Accessories	(1)
P7	SPP193	Polyethylen Bag, Main Unit	(1)
P8	SFYF20A40	Polyethylen Bag, AC Power Unit	(1)
P9	SEYF15A30	Polyethylen Bag, Pin Cords	(1)
P10	SPP189	Polyethylen Bag, Sholder Strap & Cords (AC Power Unit)	(2)
ACCESSORIES			
A1〔EF〕	SSNU101F01	Instruction Book	(1)
A1〔EK〕	SSNU101G01	Instruction Book	(1)
A1〔EG〕	SSNU101R01	Instruction Book	(1)
A1〔XA,XM〕	SSNU101X01	Instruction Book	(1)
A1〔other areas〕	SSNU101S01E	Instruction Book	(1)
A2	VYCS0133	Shoulder Strap	(1)
A3	SSDH101N01	Line Cord	(2)
A4	SSDH101N02	Video Cord	(2)
A5〔XA〕 ⚠ only	SFDKI19118	2Pin Plug	(1)

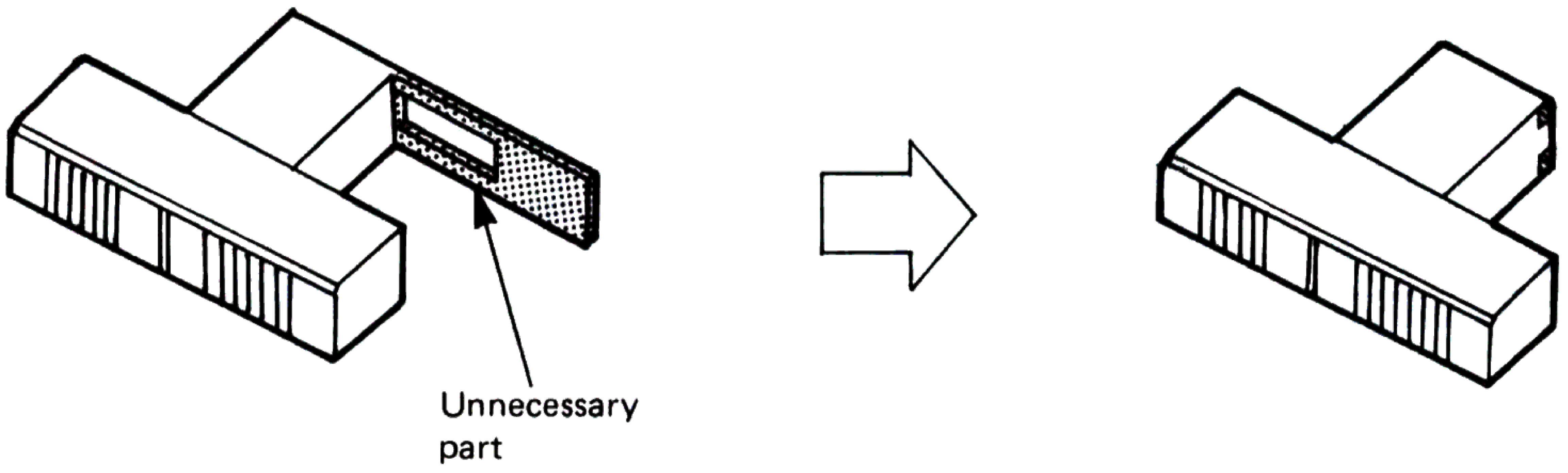
• AC power unit

Ref. No.	Part No.	Description	
CABINET and CHASSIS PARTS			
1	SSAC101N50E	Front Panel Ass'y	(1)
2	VGT0272	Knob,Recording	(1)
3	SSKT101N02	Knob,Power	(1)
4	SSAC101N51	Cabinet	(1)
5〔E,EA,EC〕	SSNN101S50	Name Plate	(1)
5〔EK,XL〕	SSNN101G50	Name Plate	(1)
5〔XA,XM〕	SSNN101X50	Name Plate	(1)
5〔other areas〕	SSNN101R50	Name Plate	(1)
6	SSEZ101N50	Bushing.DC cord	(1)
7	SSDJ101M50	DC Cord	(1)
8〔EK〕 ⚠	SJA139	AC Cord	(1)
8〔XL〕 ⚠	SJAG23	AC Cord	(1)
8〔other areas〕 ⚠	SJA137	AC Cord	(1)
9〔EK〕only	SFSR5N-4	Bushing,AC Cord	(1)
9〔other areas〕	SFSR4N-4	Bushing,AC Cord	(1)
10	SSDJ101N51	Multi Cable	(1)

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
11		SSUK101P51	Rear Panel	(1)
12		SJF3057-IN	Terminal	(1)
13		SJT345	Holder,Fuse	(2)
14		SSUK101N50	Chassis	(1)
15		SSUZ101N50	Foot	(4)
17		SHR401-2	Latch,Insulator	(1)
18		SSUZ101N51	Insulator,Power P.C.B.	(1)
19		SFDC109N01	Sheet,Power Transistor	(1)
21		SSUP101N53	Bracket,Front Panel	(2)
22		SUV453	Cover,Voltage Selector	(1)
SCREWS				
N1	Ⓢ	XTV3+10BFN	Screw,⊕3×10	(4)
N2	Ⓢ	XTS3+8B	Screw,⊕3×8	(2)
N3	Ⓢ	XTB3+6BFZ	Screw,⊕3×6	(5)
N4	Ⓢ	XTB3+8BFZ	Screw,⊕3×8	(1)
N5	Ⓢ	XTV3+8BFN	Screw,⊕3×8	(4)
N6	Ⓢ	XTN4+8BFZ	Screw,⊕4×8	(4)
N7	Ⓢ	XTN3+6BFZ	Screw,⊕3×6	(2)
N8	Ⓢ	XSN3+14S	Screw,⊕3×14	(1)
WASHERS				
N9	Ⓢ	XWE3	Washer, ϕ3	(1)
N10	Ⓢ	XWA3B	Washer, ϕ3	(1)
NUT				
N11	Ⓢ	XNG3ES	Nut, ϕ3	(1)

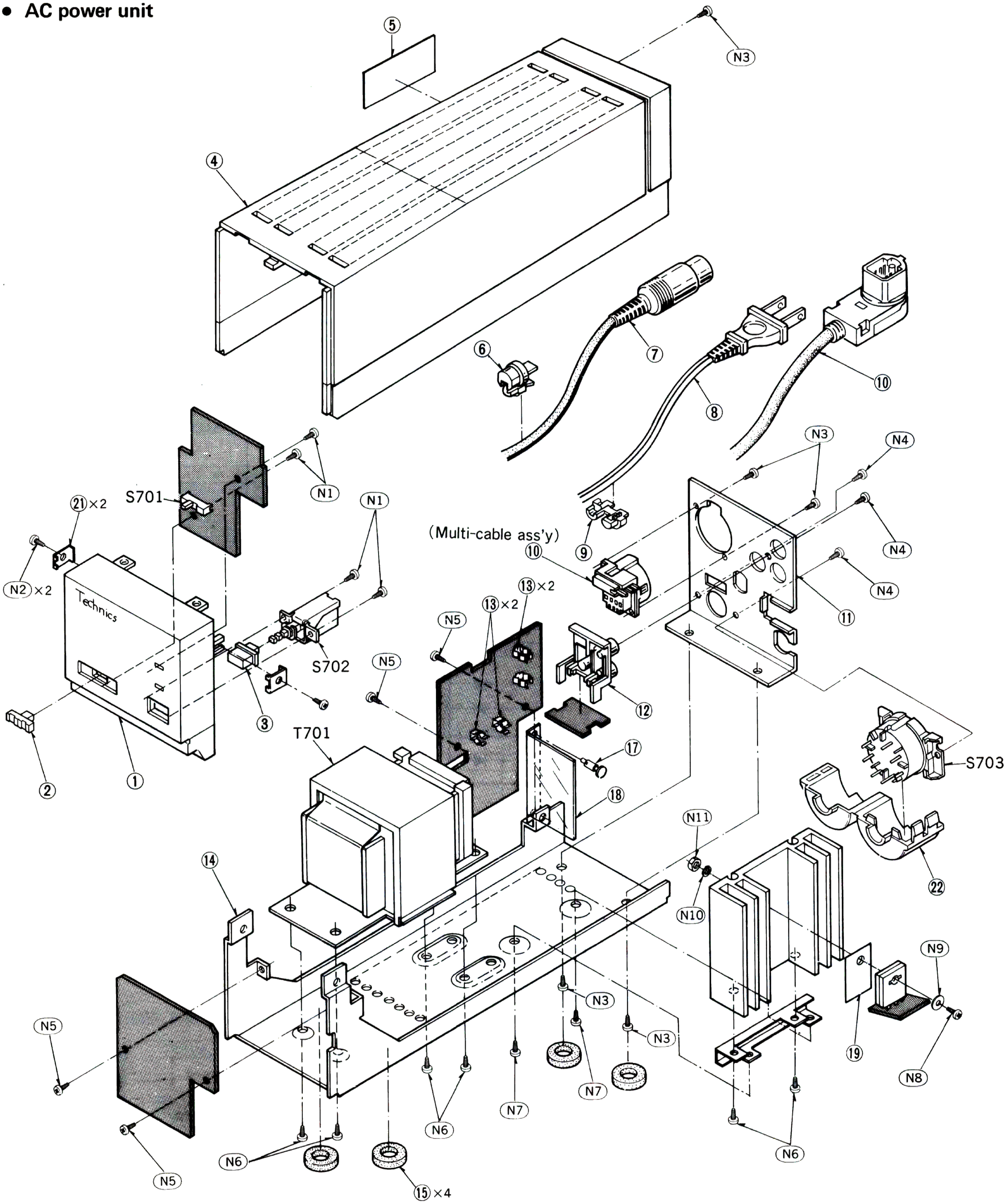
■ REPAIR KNOBS (CUTTING OFF THE UNNECESSARY PART)

The indicator switch, playback mode, playback muting and recording switch (AC power unit) knobs (VGT0272) are the parts supplied by Video Division. So, when they are used on this unit, cut off the unnecessary part by use of nippers, etc. as shown here.



■ EXPLODED VIEWS

- **AC power unit**



- **Main unit**

N5 ×2
N4
N4
N4
N4
N6
N6
17
N2
N2
N2
N2
19 ×2
18
N1
N2
N1 ×4
10
9
45
46
11 ×2
N10
N18
VR203
S603
VR202
VR201
S604
S605
47
48
N10
N17
N17
S602
S601
N1
N2
N1 ×3
7
8
1
Technics
4 ×3
2 ×2
3
5
6
31
30
N2 ×10
N2
N2
N2
N2
N2
N2
29
N7
N7
35
N1
34
32
33
36
37
N8
39
40
38
38
N2
20
21
N2
N16
N2
N3
N19
12 ×2
13
N2
N20
43
42
N2
N19
N16
N2
N2
27
28
N3 ×4
N2 ×4
N9 ×2
N15
23
22
N2
26
N2
25
24
N2
N2
N2
N2
N2
14
15
16 ×4
N14 ×4
N3 ×4
41
44

■ BLOCK DIAGRAM

- **Main unit**

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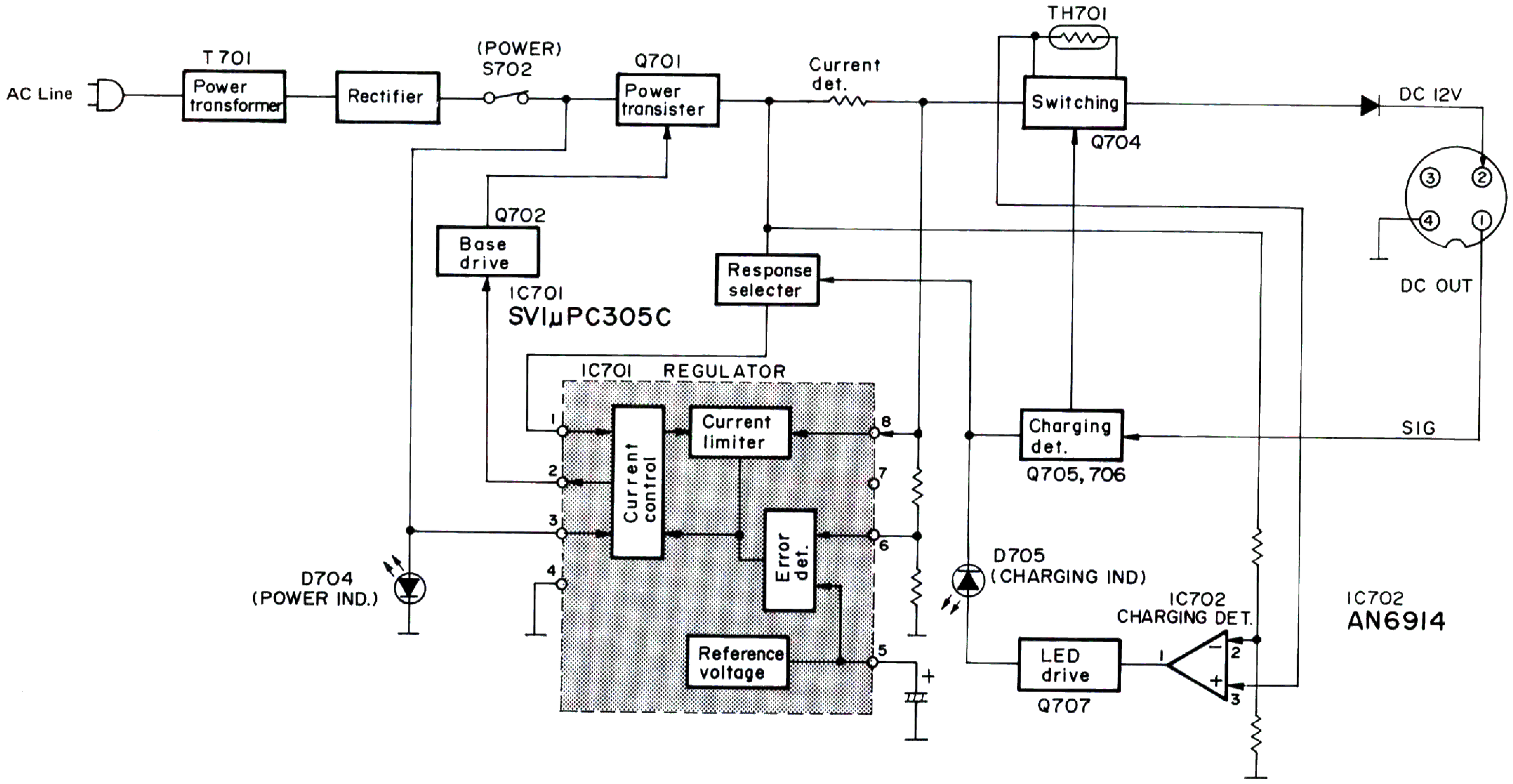
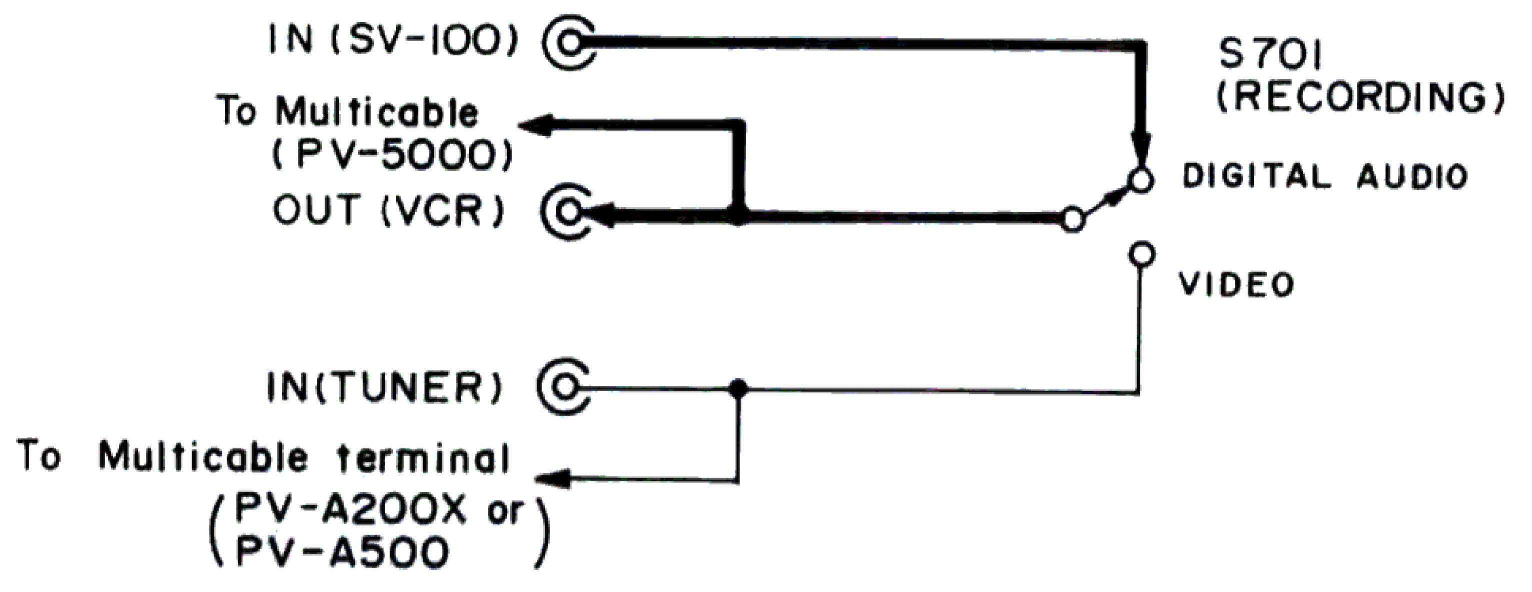
- **AC power unit**





■ PLAYBACK MODE SELECTION

This lets you select the demodulation mode that is most suitable for the playback signal of the VCR being used.
Although there is no problem when the same VCR is used for recording and playback, it may be difficult to obtain the same sound quality when a different VCR is used for playback.
In such cases, playback quality can be optimized by using the playback mode switch and adjusting VCR tracking.

1. Turn on the power on connected equipment and begin playback.
2. Set the indicator switch to "tracking/batt".
3. Watch the tracking check scale/indicator and switch the tracking mode back and forth between "1" and "2".
4. Choose the position that gives the furthest indication to the right.
   As a rule, optimum results will be obtained if the selector is set to "1" for VCR's like the PV-5000 which have an SLP (extended play) mode.
   For greatest effectiveness, perform tracking adjustment along with playback mode selection.

Note:
Other display panel indications go out when the indicator switch is set to "tracking/batt".

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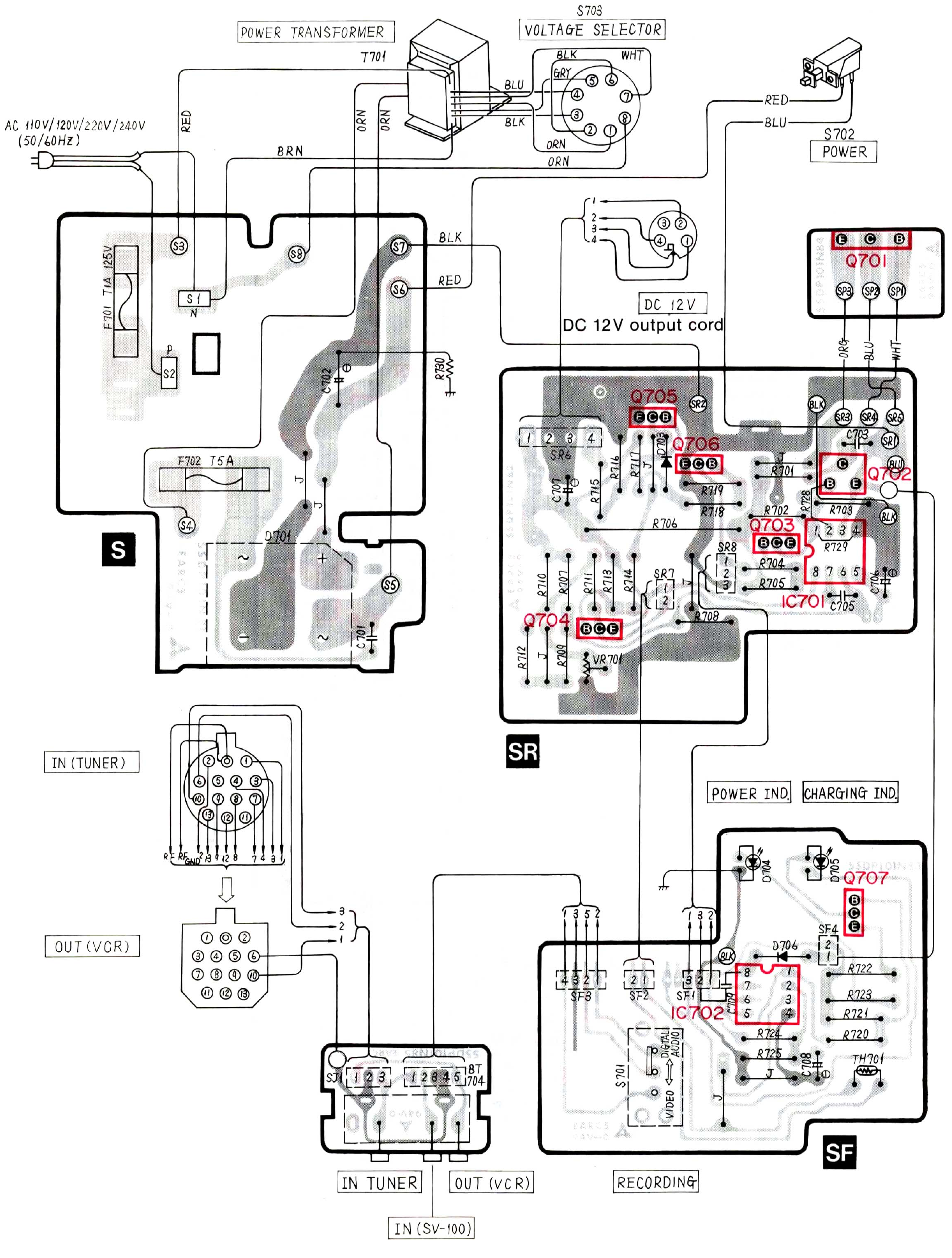
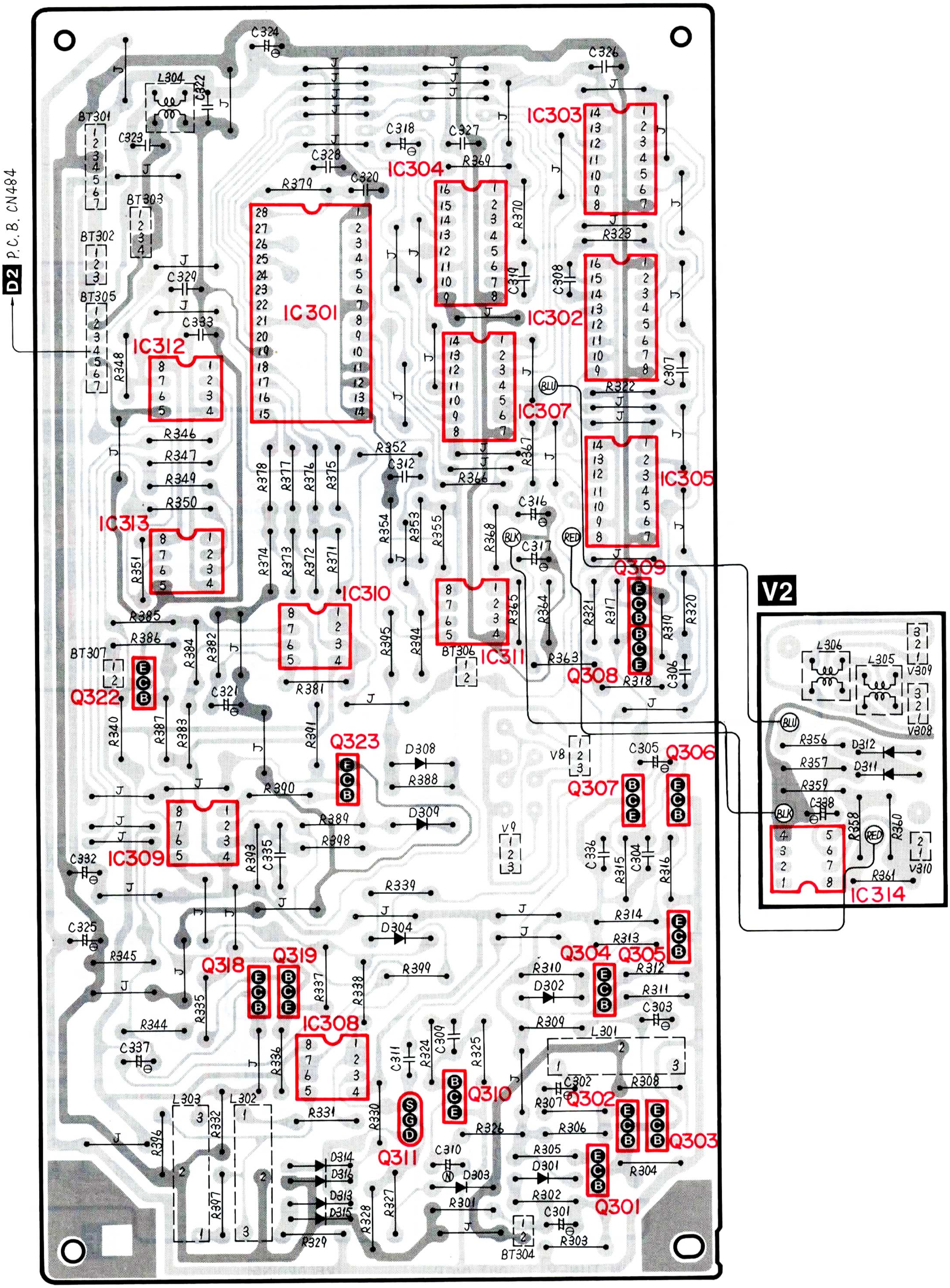
■ PRINTED CIRCUIT BOARDS

- AC power unit

Ground (Earth) line

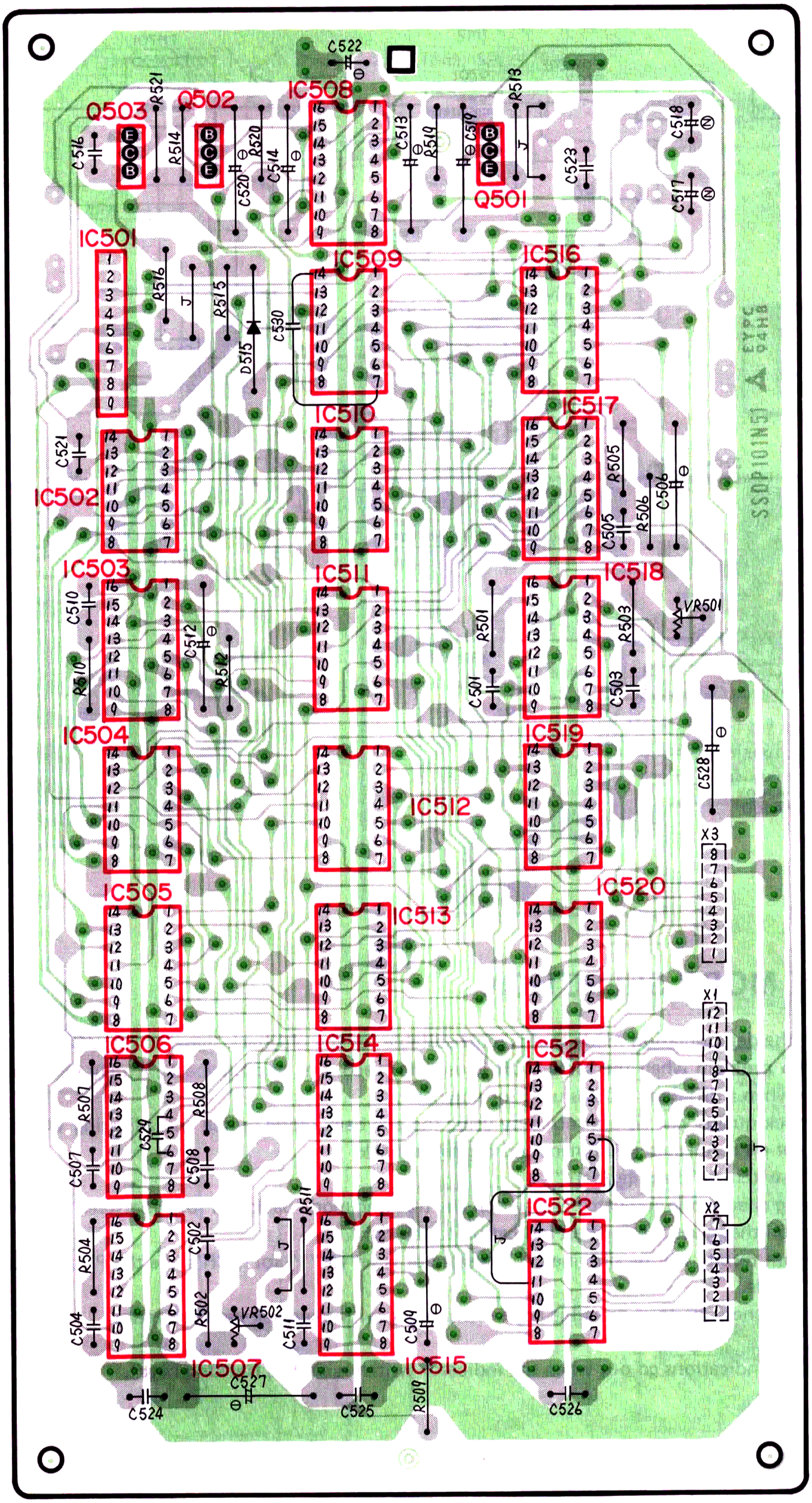


V Video circuit

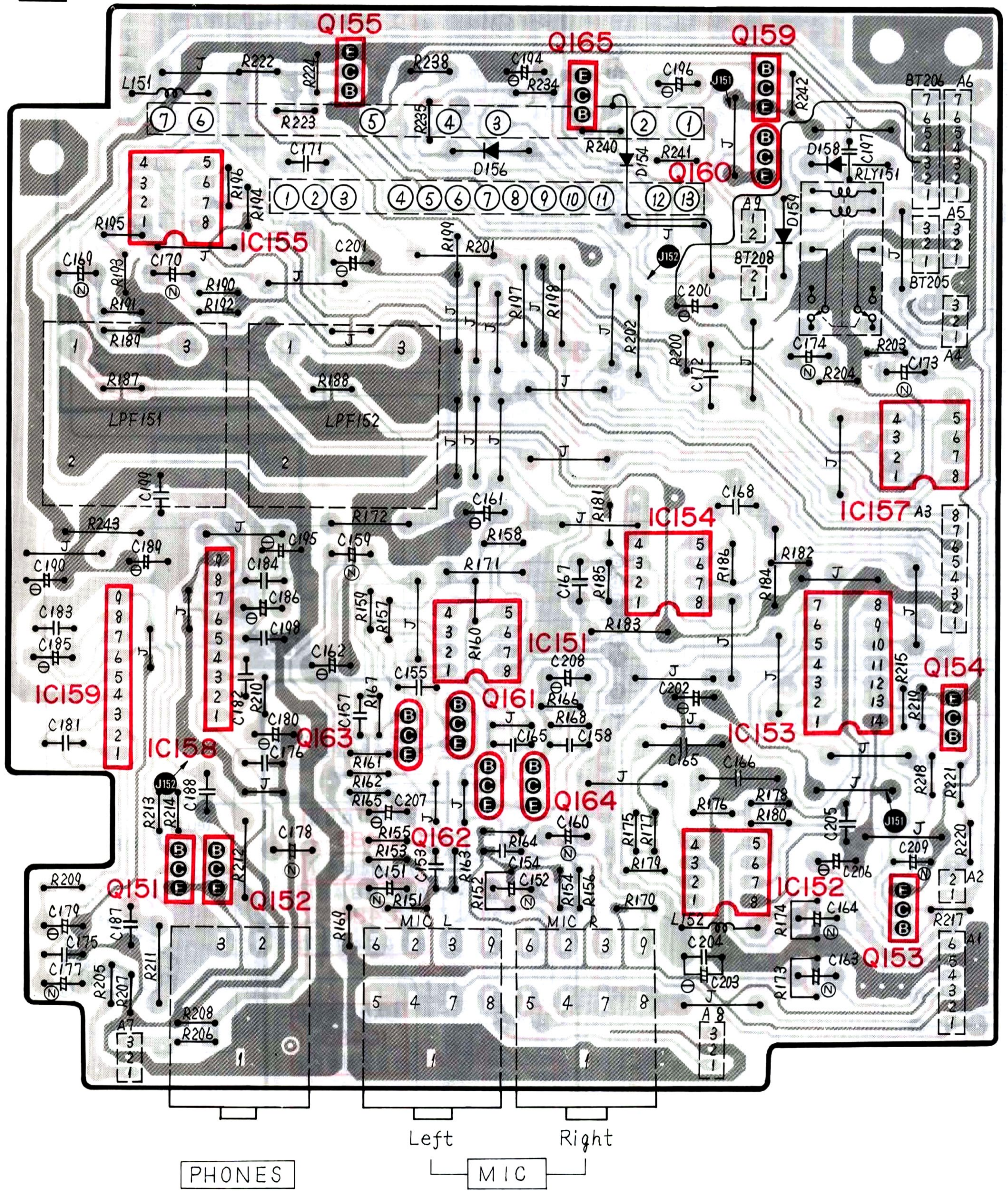


X Synchronizing circuit

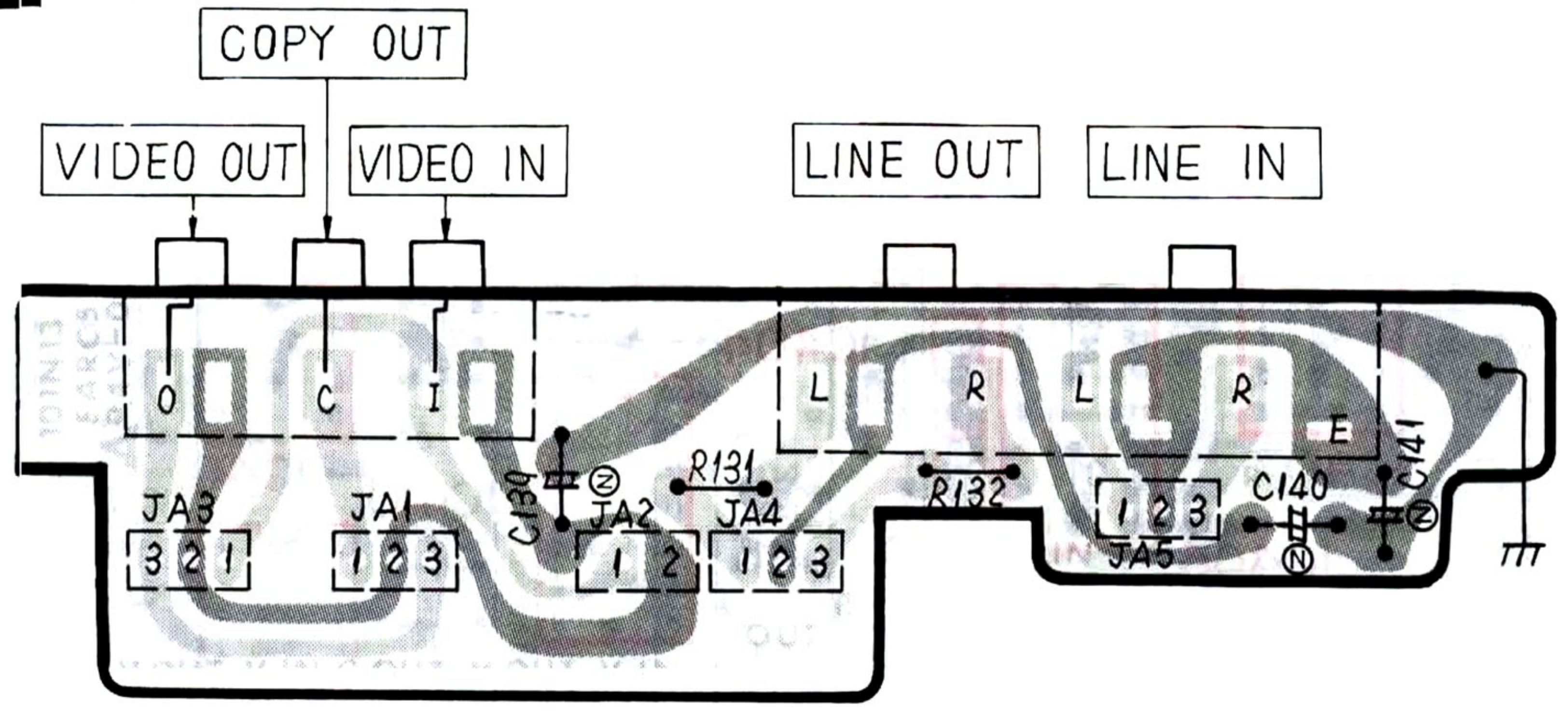
Circuit view on top of P.C.B.



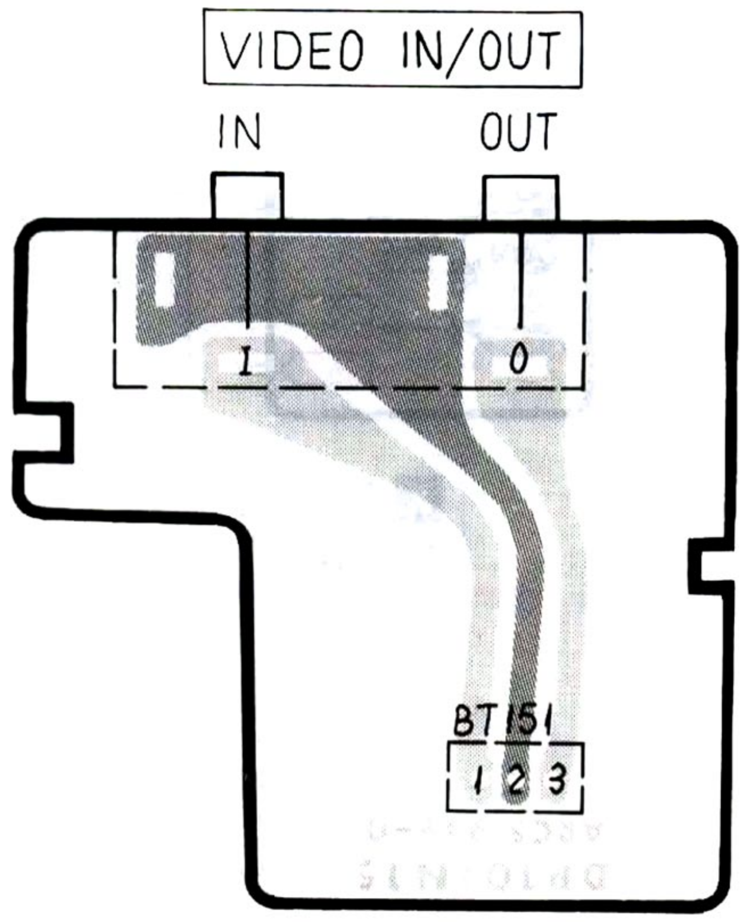
A Analog circuit



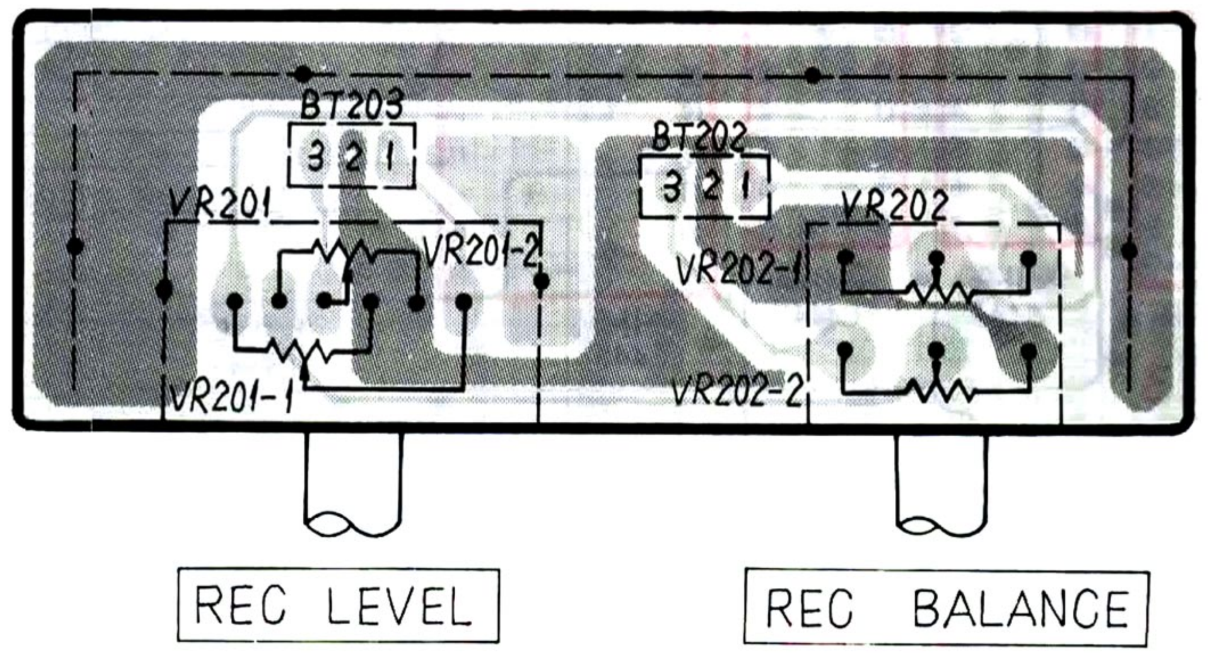
JA Input/output terminals



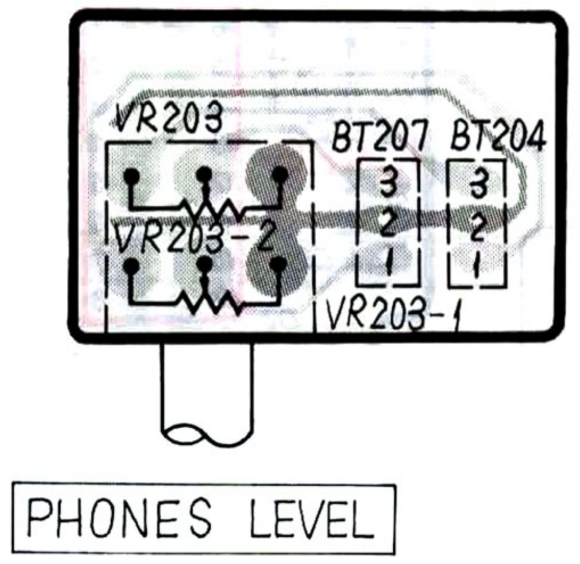
VJ Video input/output terminals



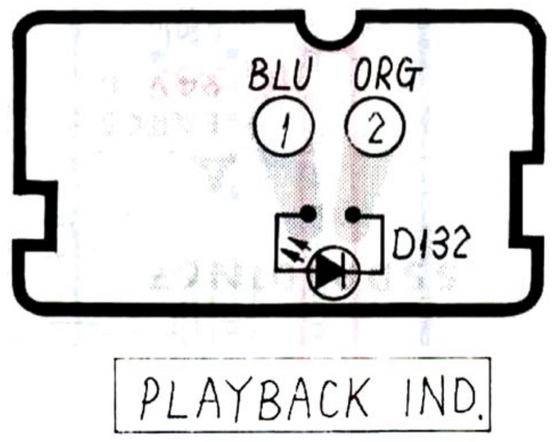
RV Recording level/balance volume

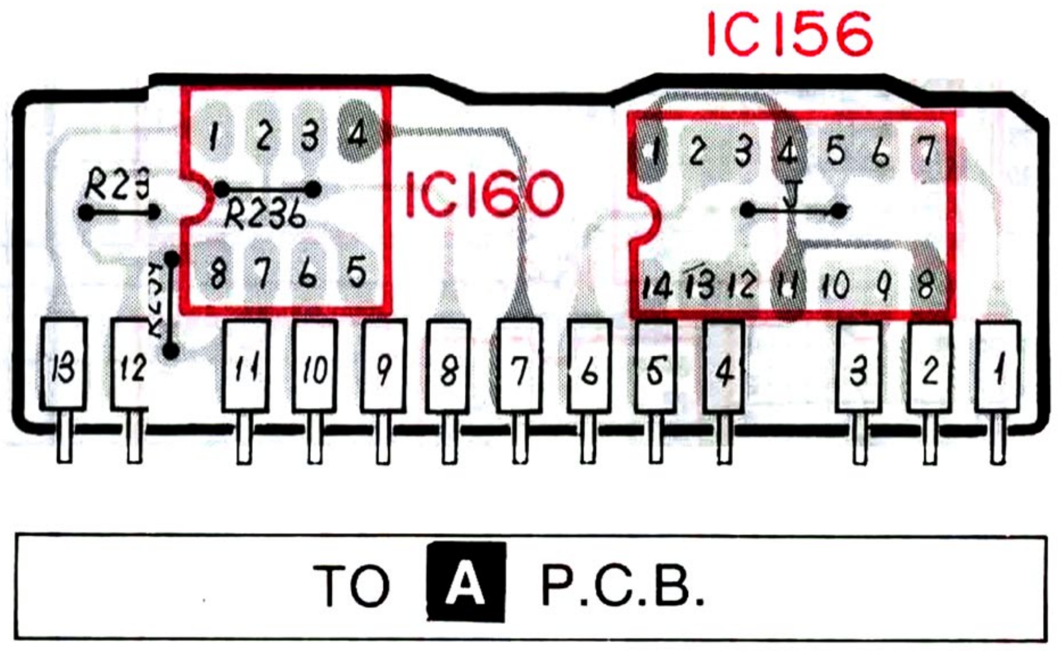


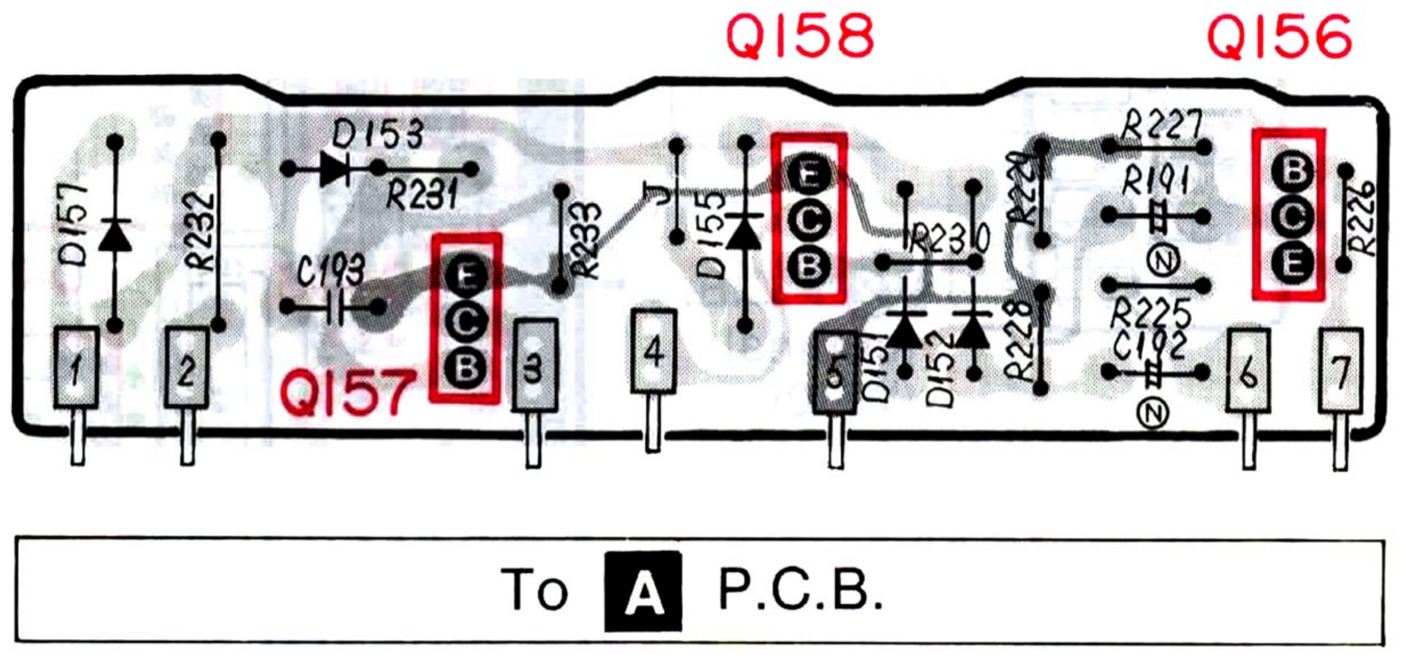
HV Phones level volume



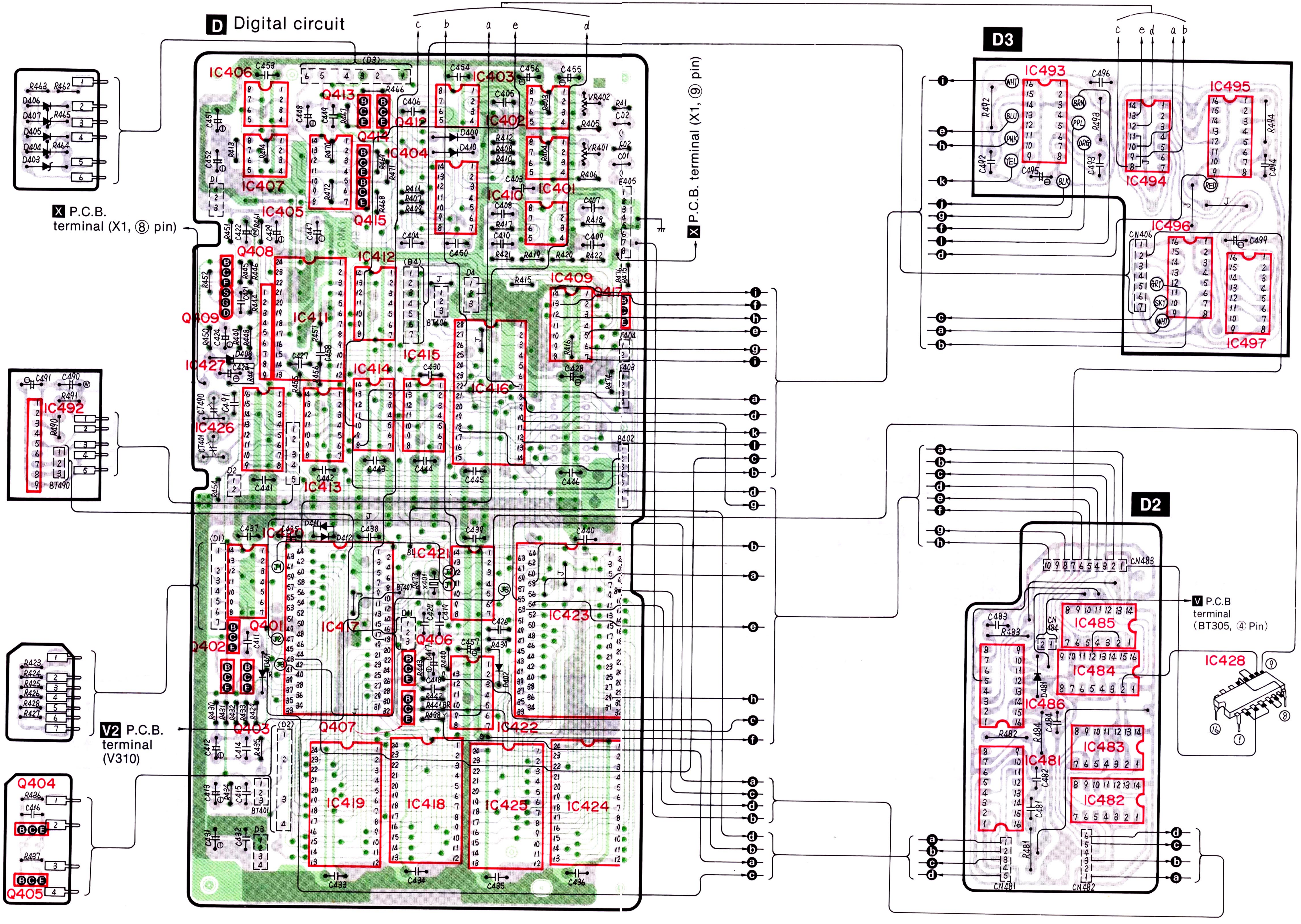
PL Playback indicator



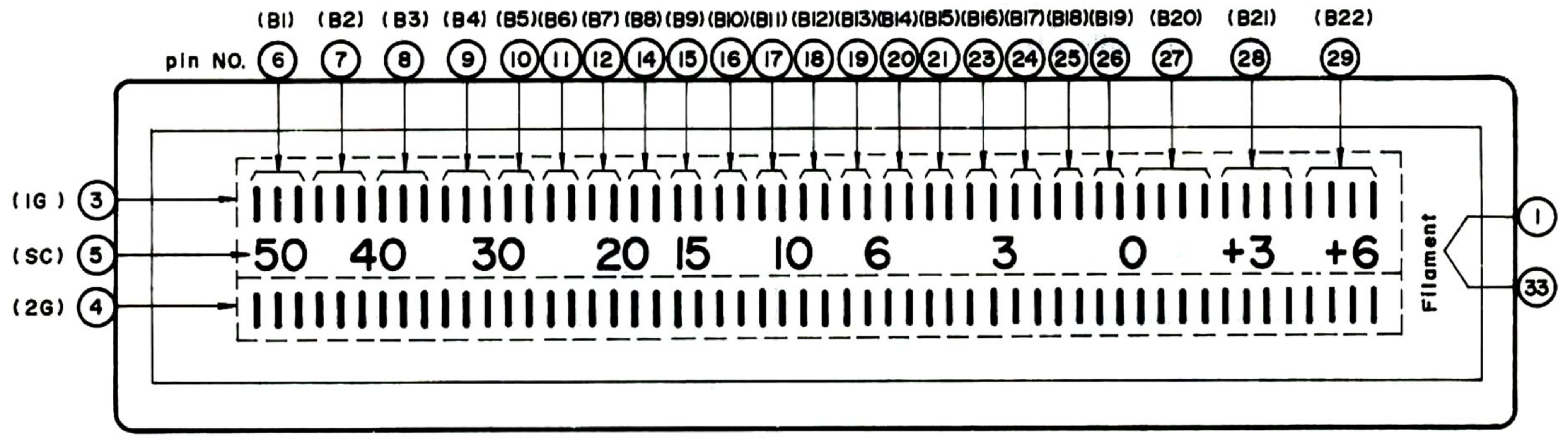




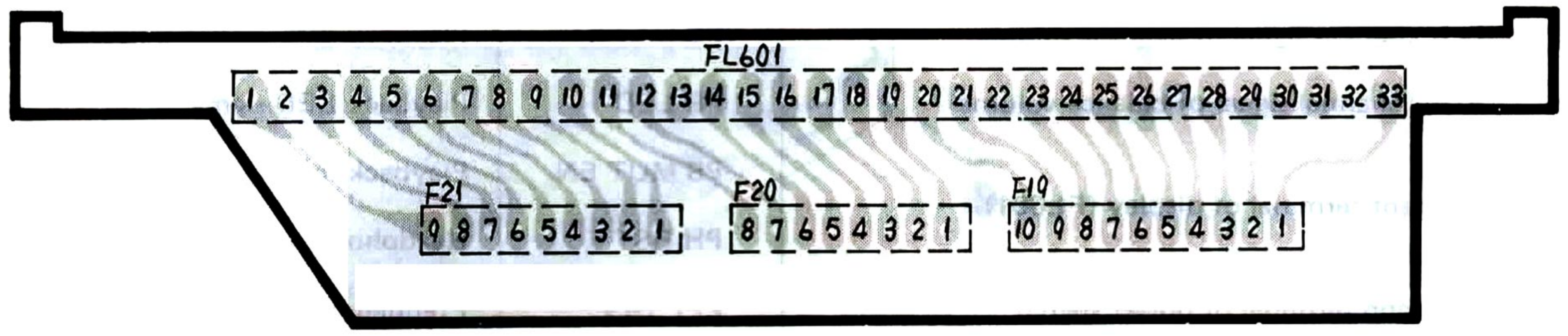
D Digital circuit



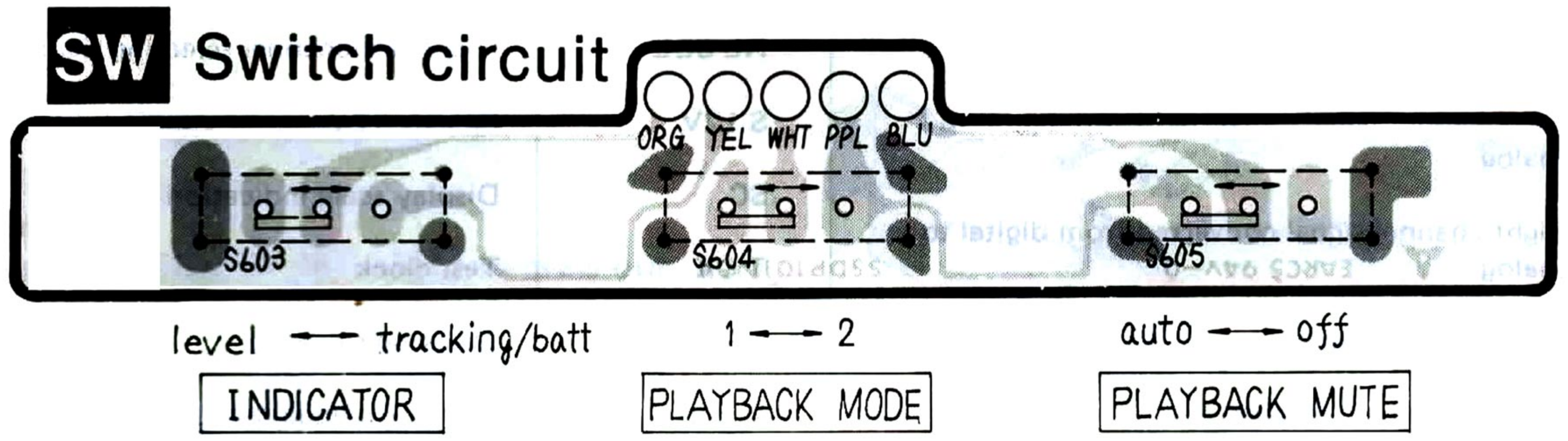
- Fluorescent Display Tube (FL)



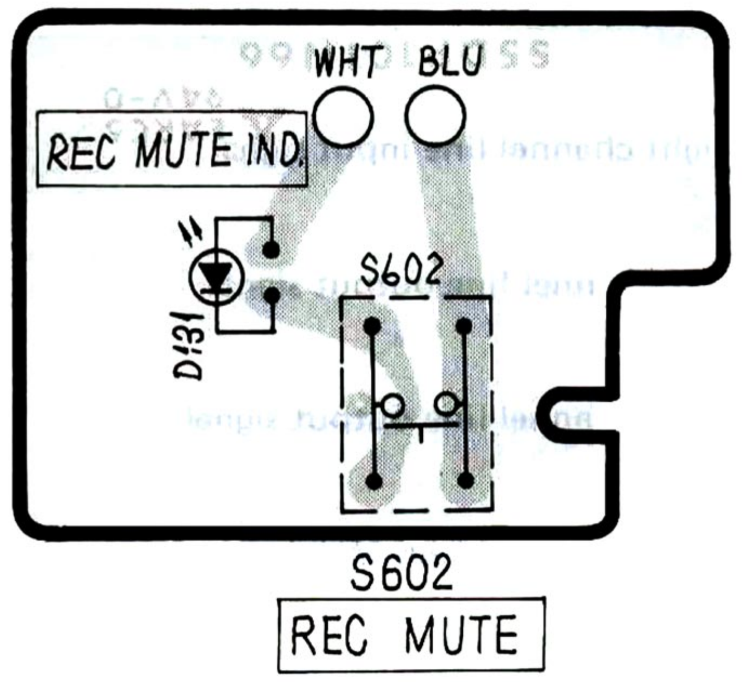
FL FL P.C.B.



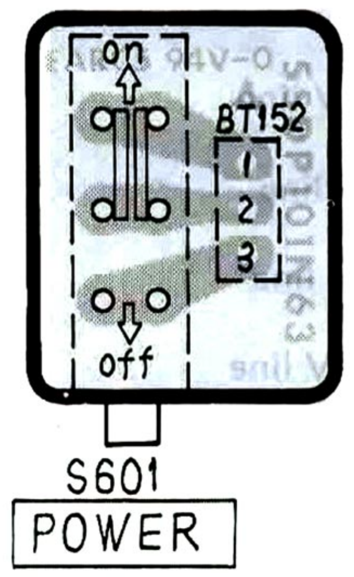
SW Switch circuit



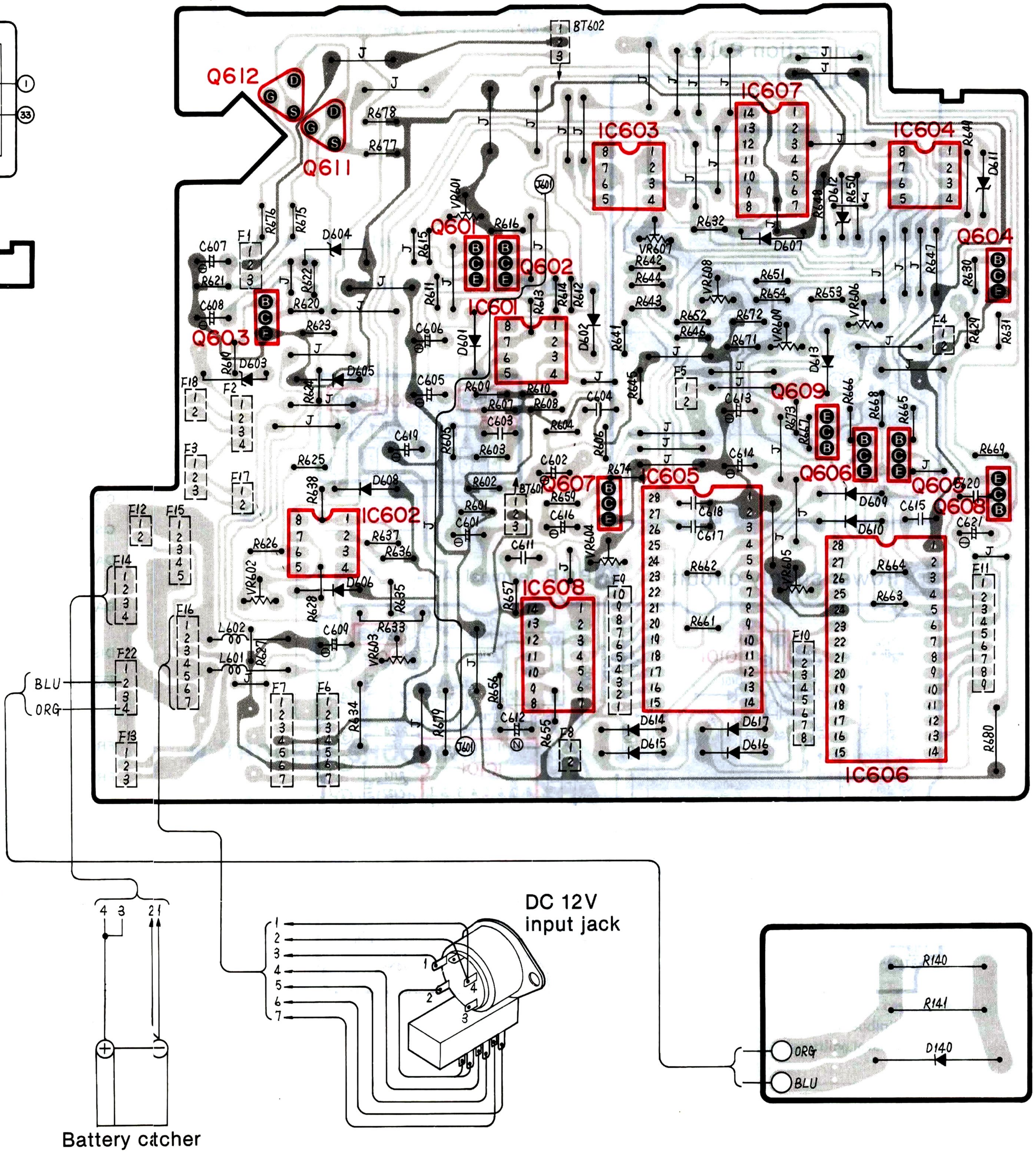
RM REC muting switch



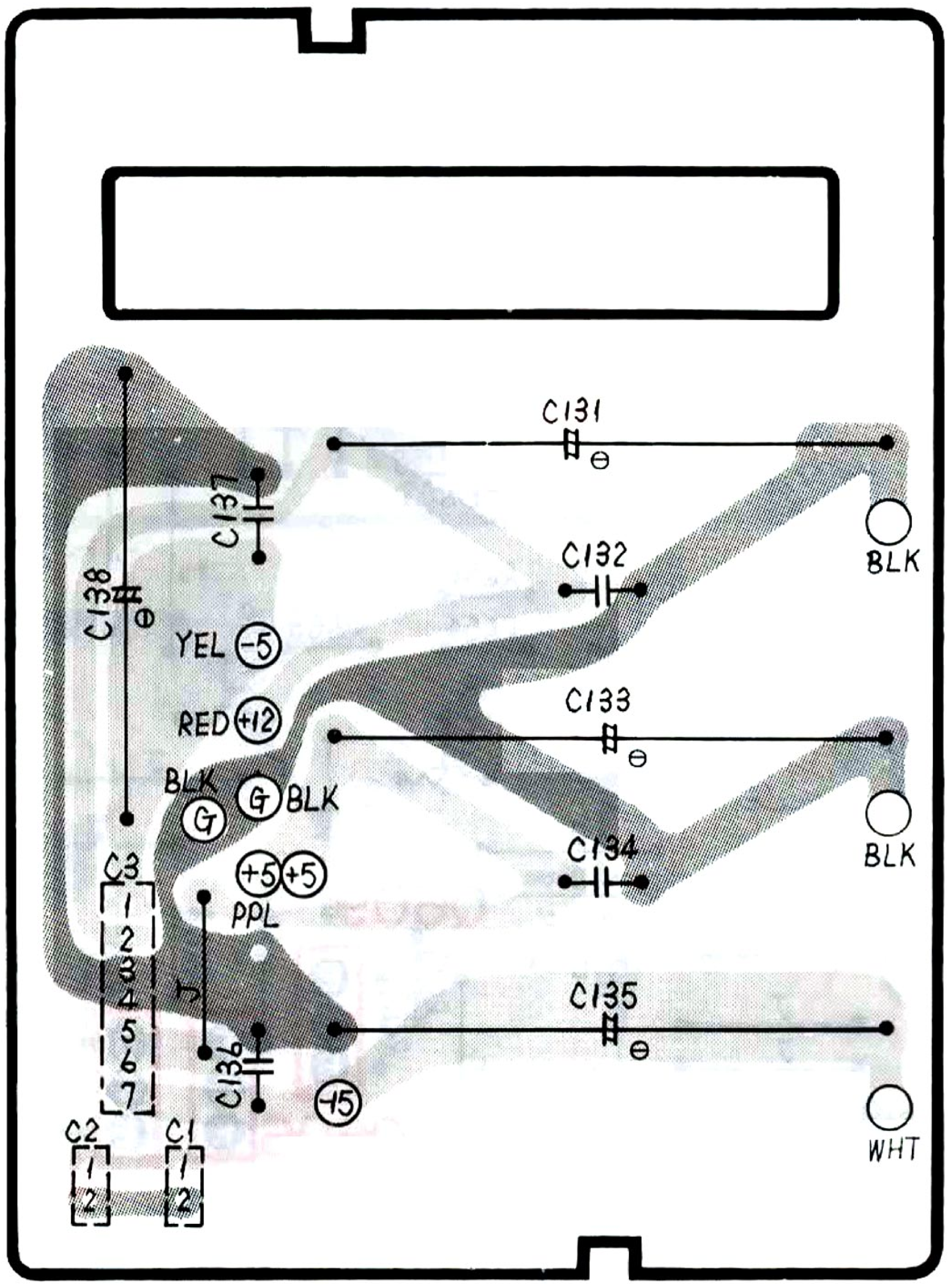
PS Power switch

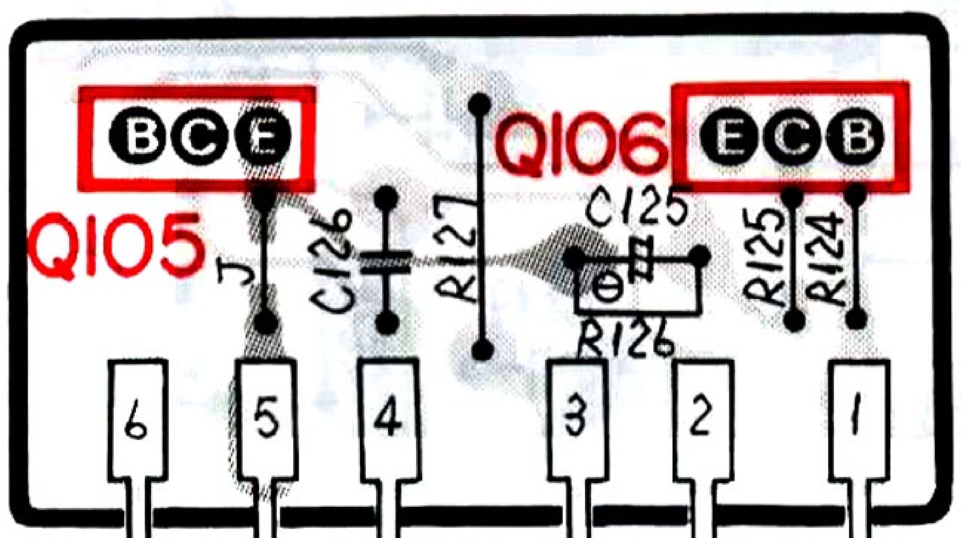


F Display circuit



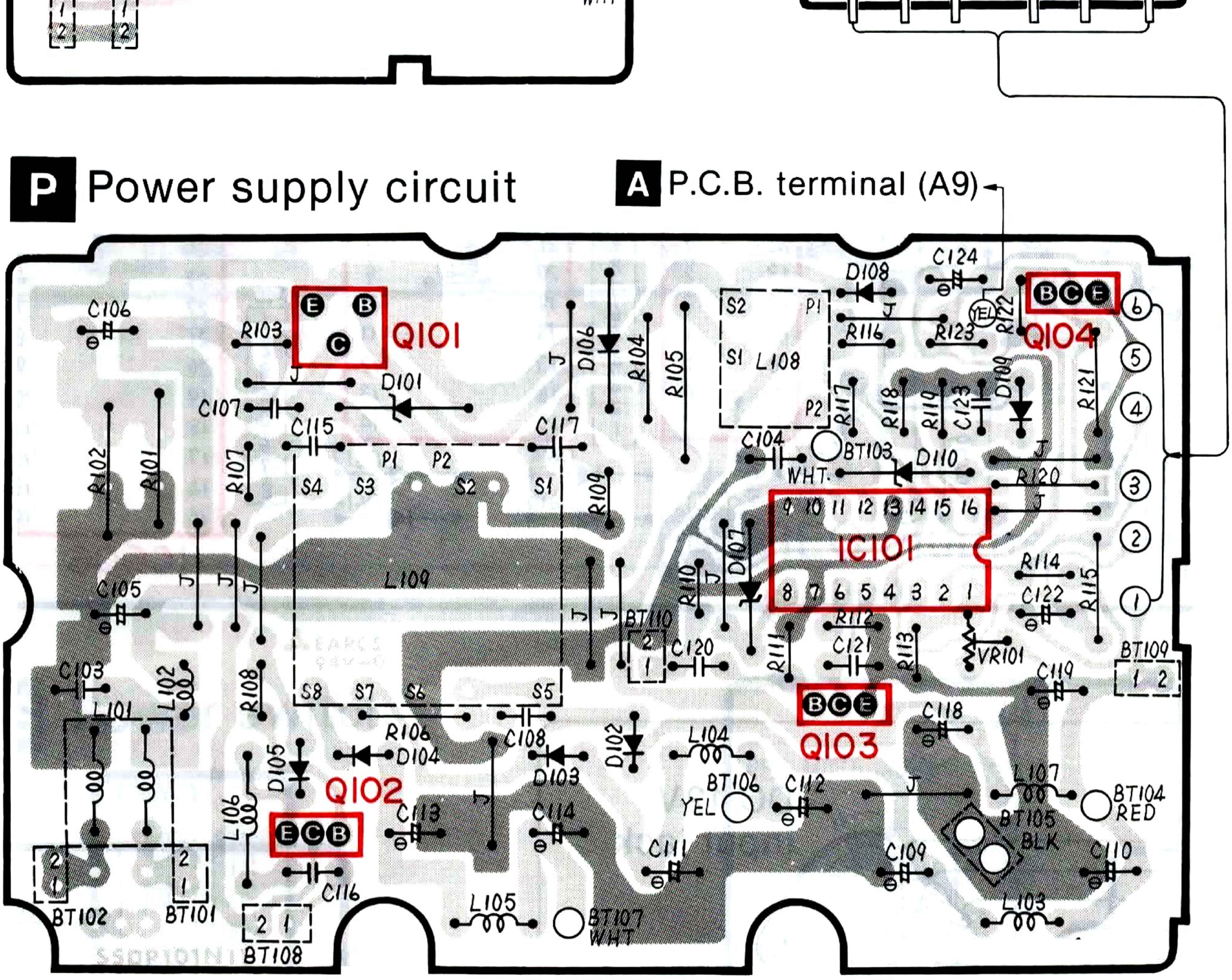
C Connection P.C.B.





P Power supply circuit

A P.C.B. terminal (A9)



■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

Note: The whilte-on-black numbers in the diagram stand for the types of connector. For the connector part No., refer to the price list of repair parts on page 26.

• Discription of terminals

Mark	Description
AD L	Lift channel signal converted from analog to digital
AD R	Right channel signal converted from analog to digital
AC 3V	AC 3V filament drive power supply
BAL VOL L	Left channel signal of balance volume
BAL VOL R	Right channel signal of balance volume
B1 ~ B22	Segment terminal of display (FL601)
COM	Common terminal of power switch
CRC	CRC (error correction) signal
CRCK	Signal at "L" only in CRC range
$\overline{\text{C SYNC}}$	Inverse signal of composite synchronizing
C SYNC IN	Input terminal of C SYNC
C SYNC OUT	Output terminal of C SYNC
DA L	Left channel signal converted from digital to analog
DAR	Right channel signal converted from digital to analog
DISP MUT	Display mute signal
$\overline{\text{EMPHA}}$	Inverse signal of emphasis
F	Filament terminal of display
FROM HP L	Left channel headphone amp input signal
FROM HP R	Right channel headphone amp input signal
GND	Ground (earth)
LINE IN L (L IN L)	Left channel line input signal
LINE IN R (L IN R)	Right channel line input signal
LINE OUT L (L OUT L)	Left channel line output signal
LINE OUT R (L OUT R)	Right channel line output signal
MCK	Master clock (15.86 MHz)
MUT	Mute signal

Mark	Description
MUT LED	LED mute signal
PB	Playback signal
PB CRCK IN	Clock input to punch CRC in 16 bits
RB CRCK OUT	Clock output to punch CRC in 16 bits
PB DATA	Playback data
PB LED	Playback LED signal
PB MUT EN	Playback muting ending signal
PH RST	Headphone output reset signal
PLL DIV	Frequency dividing signal of PLL
PW ON	Power switch "ON" terminal
REC/PB	Rec/playback selecting signal
REC VOL L	Left channel recording volume signal
REC VOL R	Right channel recording volume signal
RL SEL	Right/left channel selecting signal
S 12V	Speedy 12V
SC	Display scale indication terminal
T CK	Test clock
TRACK	Tracking signal
V EQ	Waveform equalizing control signal
VIDEO IN	Video input signal
VIDEO OUT	Video output signal
V SYNC	V pulse of video signal
V OSC	V pulse signal synchronized with V SYNC
VIDEO V	Vertical synchronizing signal
1G, 2G	Grid terminal of display
+12V	+12V line
+5V	+5V line
–5V	–5V line
–15V	–15V line

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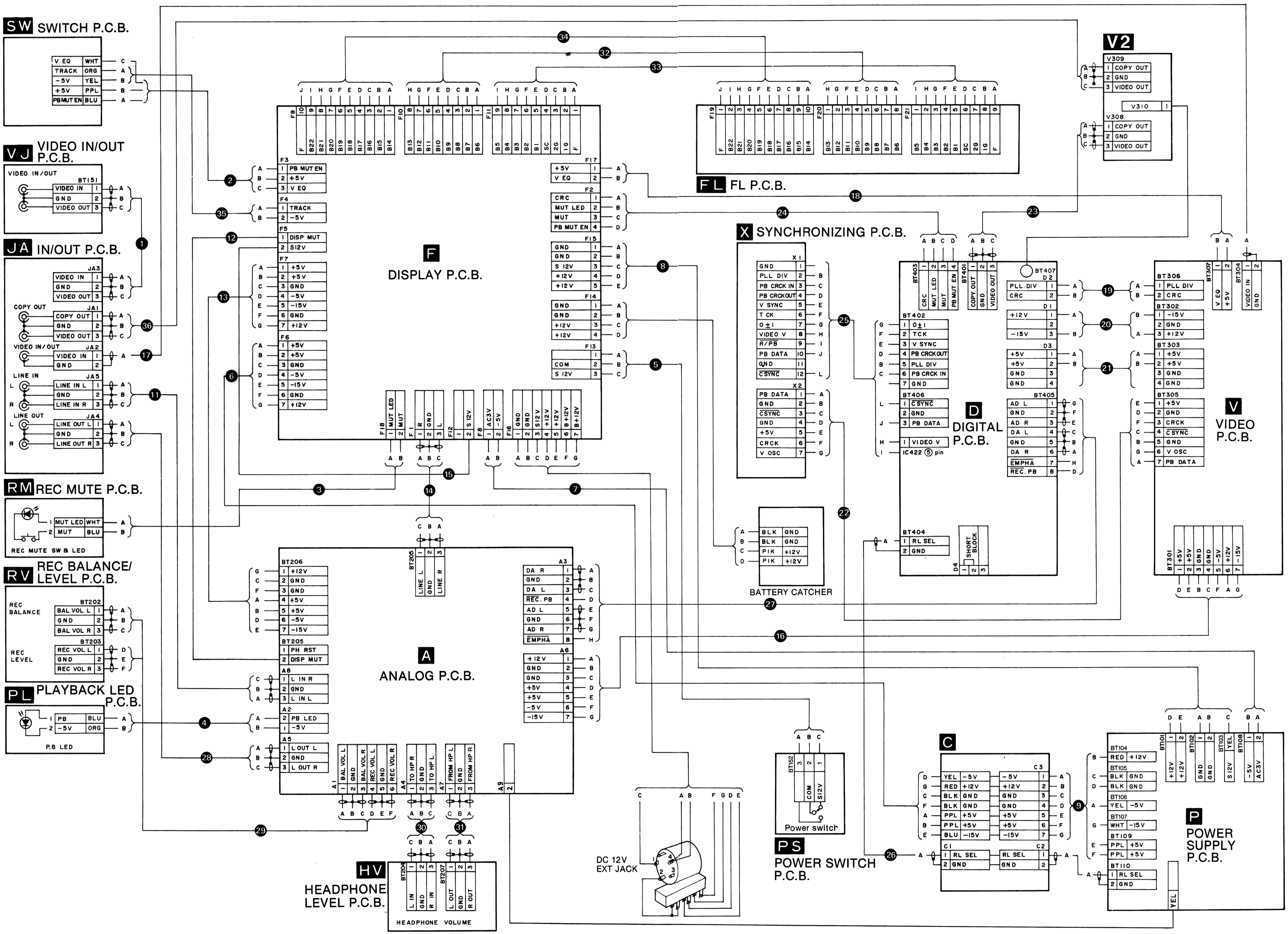
SW SWITCH P.C.B.
VJ VIDEO IN/OUT P.C.B.
JA IN/OUT P.C.B.
RM REC MUTE P.C.B.
REC MUTE SW & LED
RV REC BALANCE/ LEVEL P.C.B.
PL PLAYBACK LED P.C.B.
P.B LED
F DISPLAY P.C.B.
FL FL P.C.B.
V2
X SYNCHRONIZING P.C.B.
D DIGITAL P.C.B.
V VIDEO P.C.B.
BATTERY CATCHER
A ANALOG P.C.B.
HV HEADPHONE LEVEL P.C.B.
HEADPHONE VOLUME
DC 12V EXT JACK
PS POWER SWITCH P.C.B.
Power switch
C
P POWER SUPPLY P.C.B.

■ RESISTORS & CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is Ω(ohm). K = 1000Ω , M = 1000kΩ
5. The unit of capacitance is μF (microfarad) P = 10^{-6} μF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

ERX	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	F : ± 1%
ERG : Metal Oxide	25 : 1/4W	G : ± 2%
ERO : Metal Film	50 : 1/2W	J : ± 5%
ERF : Metal Film	1A : 1W	K : ± 10%
ERQ : Fuse	2F : 1/4W	
	12S : 1/2W	
	3A : 3W	

ERD2FCG □□□ → Fuse type carbon (1/4W)
ERD10TJ □□□ → Chip type carbon
ERO10MKG □□□ → Chip type metal film

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Reculiarity use	Value	Special use

Capacitor Type	Voltage	Tolerance
ECEA : Electrolytic	OJ : 6.3V	C : ± 0.25pF
ECEB : Electrolytic	1A : 16V	G : ± 2%
ECEA . . . N : Non Polar Electrolytic	1C : 16V	J : ± 5%
ECCD : Ceramic	16 : 16V	K : ± 10%
ECCR : Ceramic	1E : 25V	M : ± 20%
ECQM : Polyester	25 : 25V	P : +100%, –0%
ECQP : Polypropylene	1H : 50V	Z : +80%, –20%
ECES : Electrolytic	1J : 63V	
	50 : 50V	
	1VV : 35V	
	ECQP1 : 100V	

ECUV1H ○○○ □□□ → Chip type ceramic
(○○○ = Value, □□□ = Peculiarity)

● Main unit

Ref. No.	Part No.	Value
RESISTORS		
R101,102 ⚠	ERQ12HKR22	0.22
R103 Ⓢ	ERD25FJ121	120
R104 ⚠	ERD2FCG100	10
R105 Ⓢ	ERX1ANJ2R7	2.7
R106,107 Ⓢ	ERD25FJ561	560
R108 Ⓢ	ERD25TJ223	22K
R109 Ⓢ	ERD25FJ561	560
R110 Ⓢ	ERD25FJ472	4.7K
R111 Ⓢ	ERD25FJ103	10K
R112 Ⓢ	ERD25TJ223	22K
R113 Ⓢ	ERD25TJ154	150K
R114 Ⓢ	ERD25FJ272	2.7K
R115 Ⓢ	ERD25TJ823	82K
R116 Ⓢ	ERD25FJ472	4.7K
R117 Ⓢ	ERD25TJ823	82K
R118 Ⓢ	ERD25FJ103	10K
R119,120 Ⓢ	ERD25FJ472	4.7K
R121 Ⓢ	ERD25TJ473	47K
R122 Ⓢ	ERD25FJ472	4.7K
R123 Ⓢ	ERD25TJ104	100K
R124,125	ERD10TLJ473U	47K
R126	ERD10TLJ103U	10K
R127 Ⓢ	ERD25FJ561	560
R131,132 Ⓢ	ERD25FJ561	560
R140,141	ERG1ANJR68	0.68
R151,152	ERD10TLJ561U	560
R153,154	ERD10TLJ473U	47K
R155,156	ERD10TLJ221U	220
R157,158	ERD10TLJ332U	3.3K
R159,160	ERD10TLJ332U	3.3K
R161,162	ERD10TLJ332U	3.3K
R163,164	ERD10TLJ221U	220
R165,166	ERD10TLJ223U	22K
R167,168	ERD10TLJ103U	10K
R169,170	ERD10TLJ124U	120K
R171 ⚠	ERD2FCG470	47
R172 Ⓢ	ERD25FJ102	1K
R173,174	ERD10TLJ124U	120K

Ref. No.	Part No.	Value
RESISTORS		
R175,176	ERO10MKF4640	464
R177,178	ERO10MKF2001	2K
R179,180	ERO10MKF2431	2.43K
R181,182	ERD10TLJ124U	120K
R183,184 Ⓢ	ERO25CKF1801	1.8K
R185,186	ERO10MKF1001	1K
R187,188	ERD10TLJ272U	2.7K
R189,190	ERD10TLJ272U	2.7K
R191,192	ERD10TLJ124U	120K
R193,194	ERO10MKF2431	2.43K
R195,196	ERO10MKF3922	39.2K
R197,198 Ⓢ	ERO25CKF1102	11K
R199,200	ERO10MKF3922	39.2K
R201,202 Ⓢ	ERO25CKF3601	3.6K
R203,204	ERD10TLJ223U	22K
R205,206	ERD10TLJ224U	220K
R207,208	ERD10TLJ332U	3.3K
R209,210	ERD10TLJ151U	150
R211,212	ERG12SJ120J	12
R213,214	ERD10TLJ102U	1K
R215	ERD10TLJ473U	47K
R217	ERD10TLJ272U	2.7K
R218	ERD10TLJ103U	10K
R219	ERD10TLJ272U	2.7K
R220,221	ERD10TLJ221U	220
R222,223	ERD10TLJ473U	47K
R224	ERD10TLJ103U	10K
R225	ERD10TLJ473U	47K
R226	ERD10TLJ103U	10K
R227	ERD10TLJ473U	47K
R228,229	ERD10TLJ124U	120K
R230,231	ERD10TLJ472U	4.7K
R232,233	ERD10TLJ103U	10K
R234	ERD10TLJ332U	3.3K
R235	ERD10TLJ272U	2.7K
R236	ERD10TLJ474U	470K
R237	ERD10TLJ103U	10K
R238	ERD10TLJ473U	47K

Ref. No.	Part No.	Value
RESISTORS		
R239,240	ERD10TLJ472U	4.7K
R241	ERD10TLJ223U	22K
R242	ERD10TLJ102U	1K
R243 Ⓢ	ERD25FJ3R3	3.3
R301 Ⓢ	ERD25FJ820	82
R302 Ⓢ	ERD25FJ472	4.7K
R303 Ⓢ	ERD25TJ223	22K
R304 Ⓢ	ERD25FJ472	4.7K
R305 Ⓢ	ERD25FJ222	2.2K
R306 Ⓢ	ERD25FJ272	2.7K
R307,308 Ⓢ	ERD25FJ102	1K
R309,310 Ⓢ	ERD25FJ472	4.7K
R311 Ⓢ	ERD25TJ393	39K
R312 Ⓢ	ERD25FJ472	4.7K
R313 Ⓢ	ERD25FJ122	1.2K
R314 Ⓢ	ERD25FJ272	2.7K
R315 Ⓢ	ERD25TJ183	18K
R316 Ⓢ	ERD25FJ472	4.7K
R317 Ⓢ	ERD25TJ153	15K
R318 Ⓢ	ERD25FJ680	68
R319 Ⓢ	ERD25FJ472	4.7K
R320 Ⓢ	ERD25TJ153	15K
R321 Ⓢ	ERD25FJ472	4.7K
R322 Ⓢ	ERD25FJ822	8.2K
R323 Ⓢ	ERD25FJ682	6.8K
R324 Ⓢ	ERD25FJ103	10K
R325 Ⓢ	ERD25TJ223	22K
R326,327 Ⓢ	ERD25FJ472	4.7K
R328 Ⓢ	ERD25TJ223	22K
R329,330 Ⓢ	ERD25TJ153	15K
R331,332 Ⓢ	ERD25FJ102	1K
R335 Ⓢ	ERD25FJ103	10K
R336 Ⓢ	ERD25FJ472	4.7K
R337 Ⓢ	ERD25FJ222	2.2K
R338 Ⓢ	ERD25FJ822	8.2K
R339 Ⓢ	ERD25TJ273	27K
R340 Ⓢ	ERD25FJ222	2.2K

Ref. No.	Part No.	Value
RESISTORS		
R344 Ⓢ	ERD25TJ153	15K
R345 Ⓢ	ERD25FJ102	1K
R346,347 Ⓢ	ERD25TJ102	1K
R348 Ⓢ	ERD25FJ272	2.7K
R349,350 Ⓢ	ERD25FJ102	1K
R351 Ⓢ	ERD25FJ272	2.7K
R352,353 Ⓢ	ERD25FJ103	10K
R354 Ⓢ	ERD25FJ103	10K
R355 Ⓢ	ERD25FJ102	1K
R356 Ⓢ	ERD25TJ393	39K
R357 Ⓢ	ERD25TJ124	120K
R358 Ⓢ	ERD25TJ224	220K
R359 Ⓢ	ERD25TJ183	18K
R360 Ⓢ	ERD25FJ103	10K
R361 Ⓢ	ERD25FJ102	1K
R363 Ⓢ	ERD25TJ223	22K
R364 Ⓢ	ERD25FJ561	560
R365 Ⓢ	ERD25TJ104	100K
R366 Ⓢ	ERD25FJ103	10K
R367,368 Ⓢ	ERD25TJ473	47K
R369 Ⓢ	ERD25TJ473	47K
R370 Ⓢ	ERD25FJ103	10K
R371,372 Ⓢ	ERD25TJ473	47K
R373 Ⓢ	ERD25TJ473	47K
R374,375 Ⓢ	ERD25TJ104	100K
R376,377 Ⓢ	ERD25TJ104	100K
R378 Ⓢ	ERD25TJ104	100K
R379 Ⓢ	ERD25TJ183	18K
R381 Ⓢ	ERD25FJ103	10K
R382 Ⓢ	ERD25FJ122	1.2K
R383 Ⓢ	ERD25TJ183	18K
R384 Ⓢ	ERD25FJ102	1K
R385 Ⓢ	ERD25FJ152	1.5K
R386 Ⓢ	ERD25TJ153	15K
R387 Ⓢ	ERD25TJ104	100K
R388 Ⓢ	ERD25FJ103	10K
R389 Ⓢ	ERD25FJ272	2.7K

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Ref. No.		Part No.	Value
RESISTORS			
R390	Ⓢ	ERD25TJ473	47K
R391	Ⓢ	ERD25FJ102	1K
R393	Ⓢ	ER025C2703	270
R394	Ⓢ	ERD25FJ103	10K
R395	Ⓢ	ERD25TJ473	47K
R396	Ⓢ	ERD25FJ222	2.2K
R397	Ⓢ	ERD25FJ102	1K
R398	Ⓢ	ERD25FJ222	2.2K
R399	Ⓢ	ERD25TJ153	15K
R401,402		ER010MKF1502	15K
R403,404		ER010MKF1502	15K
R405,406		ERD10TLJ103U	10K
R407,408		ER010MKF1101	1.1K
R409,410		ER010MKF4021	4.02K
R411,412		ER010MKF1101	1.1K
R413		ER010MKF4021	4.02K
R414		ER010MKF7871	7.87K
R415,416		ER010MKF4751	4.75K
R417,418		ER010MKF4321	4.32K
R419,420		ER010MKF4320	432
R421,422		ER010MKF1501	1.5K
R423		ER010MKF1000	100
R424		ER010MKF2800	280
R425		ER010MKF4640	464
R426		ER010MKF6340	634
R427		ER010MKF1101	1.1K
R428		ER010MKF2431	2.43K
R429		ERD10TLJ102U	1K
R430,431		ERD10TLJ151U	150
R432,433		ERD10TLJ151U	150
R434		ERD10TLJ124U	120K
R435,436		ERD10TLJ473U	47K
R437,438		ERD10TLJ472U	4.7K
R439		ERD10TLJ473U	47K
R440		ERD10TLJ104U	100K
R441		ERD10TLJ472U	4.7K
R442		ERD10TLJ151U	150
R443		ERD10TLJ473U	47K
R444		ERD10TLJ474U	470K
R445		ERD10TLJ103U	10K
R446		ERD10TLJ472U	4.7K
R447		ERD10TLJ103U	10K
R448		ERD10TLJ472U	4.7K
R449		ERD10TLJ223U	22K
R450		ERD10TLJ224U	220K
R451		ERD10TLJ473U	47K
R452		ERD10TLJ474U	470K
R453		ERD10TLJ102U	1K
R455,456		ERD10TLJ152U	1.5K
R457		ERD10TLJ152U	1.5K
R461		ERD10TLJ4R7U	4.7
R462,463		ERD10TLJ221U	220
R464,465		ERD10TLJ103U	10K
R466		ERD10TLJ473U	47K
R467		ERD10TLJ272U	2.7K
R468		ERD10TLJ683U	68K
R469,470		ERD10TLJ103U	10K
R471,472		ERD10TLJ224U	220K
R473		ERD10TLJ224U	220K
R474		ERD10TLJ221U	220
R475		ERD10TLJ473U	47K
R476		ERD10TLJ104U	100K
R481	Ⓢ	ERD25TJ823	82K
R482	Ⓢ	ERD25TJ333	33K
R483,484	Ⓢ	ERD25TJ393	39K
R490,491	Ⓢ	ERD25FJ103	10K
R492,493	Ⓢ	ER025CKF1002	10K
R494	Ⓢ	ERD25TJ563	56K
R501	Ⓢ	ERD25TJ473	47K
R502	Ⓢ	ERD25TJ124	120K
R503	Ⓢ	ER025CKF4702	47K
R504	Ⓢ	ERD25TJ153	15K
R505	Ⓢ	ER025CKF4702	47K
R506	Ⓢ	ERD25TJ273	27K
R507	Ⓢ	ER025CKF1243	124K
R508	Ⓢ	ERD25TJ473	47K
R509	Ⓢ	ERD25TJ154	150K
R510	Ⓢ	ERD25TJ473	47K

Ref. No.		Part No.	Value
RESISTORS			
R511	Ⓢ	ERD25TJ273	27K
R512	Ⓢ	ERD25TJ224	220K
R513,514	Ⓢ	ERD25FJ272	2.7K
R515,516	Ⓢ	ERD25FJ103	10K
R519,520	Ⓢ	ERD25FJ103	10K
R521	Ⓢ	ERD25FJ103	10K
R601,602		ERD10TLJ474U	470K
R603,604		ERD10TLJ153U	15K
R605,606		ERD10TLJ473U	47K
R607,608		ERD10TLJ473U	47K
R609,610		ERD10TLJ223U	22K
R611,612		ERD10TLJ124U	120K
R613,614		ERD10TLJ472U	4.7K
R615		ERD10TLJ103U	10K
R616		ERD10TLJ474U	470K
R619		ERD10TLJ472U	4.7K
R620		ERD10TLJ184U	180K
R621		ERD10TLJ474U	470K
R622,623		ERD10TLJ124U	120K
R624,625		ERD10TLJ472U	4.7K
R626		ERD10TLJ153U	15K
R627		ERD10TLJ473U	47K
R628		ERD10TLJ103U	10K
R629		ERD10TLJ223U	22K
R630		ERD10TLJ474U	470K
R631		ERD10TLJ224U	220K
R632		ERD10TLJ472U	4.7K
R633	Ⓢ	ER025CKF2202	22K
R634	Ⓢ	ER025CKF1302	13K
R635		ERD10TLJ103U	10K
R636		ERD10TLJ472U	4.7K
R637		ERD10TLJ223U	22K
R638		ERD10TLJ103U	10K
R641,642		ERD10TLJ104U	100K
R643,644	Ⓢ	ERD25TJ274	270K
R645,646		ERD10TLJ683U	68K
R647,648	Ⓢ	ER025CKF1002	10K
R649,650	Ⓢ	ER025CKF2153	215K
R651,652		ERD10TLJ104U	100K
R653,654		ERD10TLJ224U	220K
R655		ERD10TLJ124U	120K
R656		ERD10TLJ683U	68K
R657		ERD10TLJ124U	120K
R659		ERD10TLJ103U	10K
R661,662		ERD10TLJ223U	22K
R663,664		ERD10TLJ223U	22K
R665,666		ERD10TLJ103U	10K
R667,668		ERD10TLJ473U	47K
R669		ERD10TLJ124U	120K
R671,672		ERD10TLJ683U	68K
R673		ERD10TLJ103U	10K
R674,675		ERD10TLJ103U	10K
R676,677		ERD10TLJ103U	10K
R678		ERD10TLJ103U	10K
R679	⚠	ERD2FCG560	56
R680	Ⓢ	ERD25FJ100	10

● AC power unit

Ref. No.		Part No.	Value
RESISTORS			
R701	Ⓢ	ERD25FJ121	120
R702	⚠	ERD2FCG560	56
R703	Ⓢ	ERD25FJ122	1.2K
R704	Ⓢ	ERD25FJ472	4.7K
R705	Ⓢ	ERD25TJ473	47K
R706	⚠	ERF3AKR47	0.47
R707	Ⓢ	ERD25TJ683	68K
R708	Ⓢ	ERD25TJ123	12K
R709	Ⓢ	ERD25FJ102	1K
R710	Ⓢ	ERD25FJ182	1.8K
R711	Ⓢ	ERD25FJ121	120
R712	Ⓢ	ERD25FJ332	3.3K
R713	Ⓢ	ERD25TJ473	47K
R714,715	Ⓢ	ERD25FJ472	4.7K
R716	Ⓢ	ERD25TJ683	68K
R717	Ⓢ	ERD25FJ681	680K
R718	Ⓢ	ERD25FJ472	4.7K
R719	Ⓢ	ERD25FJ222	2.2K
R720	Ⓢ	ERD25FJ682	6.8K
R721	Ⓢ	ERD25TJ473	47K
R722,723	⚠Ⓢ	ERD50FJ681	680
R724	⚠	ERD2FCG101	100
R725	Ⓢ	ERD25TJ393	39K
R728	Ⓢ	ERD25FJ822	8.2K
R729	Ⓢ	ERD25FJ152	1.5K
R730	Ⓢ	ERD25TJ104	100K

● Main unit

Ref. No.		Part No.	Value
CAPACITORS			
C103,104	Ⓢ	ECKD1H103MD	0.01
C105	Ⓢ	ECEA1CS471	470
C106		ECEA1CF471	470
C107	Ⓢ	ECQM1H272JZ	0.0027
C108	Ⓢ	ECCD1H101K	100P
C109		ECEA1CF471	470
C110	Ⓢ	ECEA1CS471	470
C111	Ⓢ	ECEA1AF471	470
C112	Ⓢ	ECEA0JS471	470
C113		ECEA1CF471	470
C114	Ⓢ	ECEA1CS471	470
C115	Ⓢ	ECCD1H101K	100P
C116	Ⓢ	ECQMIH473JZ	0.047
C117	Ⓢ	ECCD1H101K	100P
C118		ECEA1AF471	470
C119	Ⓢ	ECEA0JS471	470
C120	Ⓢ	ECCD1H560K	56P
C121	Ⓢ	ECQM1H122JZ	0.0012
C122	Ⓢ	ECEA50ZR1	0.1
C123	Ⓢ	ECQM1H103JZ	0.01
C124	Ⓢ	ECEA1AS470	47
C125	Ⓢ	ECEA1AS101	100
C126	Ⓢ	ECQM1H223JZ	0.022
C131	Ⓢ	ECEB1CS222	2200
C132	Ⓢ	ECKD1H103MD	0.01
C133	Ⓢ	ECEB0JS472	4700
C134	Ⓢ	ECKD1H103MD	0.01
C135	Ⓢ	ECEB1CS222	2200
C136,137	Ⓢ	ECKD1H103MD	0.01
C138	Ⓢ	ECEB1AS222	2200
C139,140	⚠	ECEA1CN100S	10
C141	⚠	ECEA1CN100S	10
C151,152	⚠	ECEA1CN100S	10
C153,154		ECUV1H102MBM	0.001
C155,156		ECUV1H103MBM	0.01
C157,158		ECUV1H101KM	100P
C159,160	⚠	ECEA1CN100S	10
C161	Ⓢ	ECEA1CS221	220
C162	Ⓢ	ECEA1CS331	330
C163,164	⚠	ECEA1CN100S	10
C165,166		ECQP1303GZ	0.03
C167,168		ECQP1202GZ	0.002
C169,170	⚠	ECEA1EN3R3S	3.3
C171,172		ECQP1392GZ	0.0039
C173,174	⚠	ECEA1CN330S	33
C175,176		ECUV1H102MBM	0.001
C177,178	⚠	ECEA1EN3R3S	3.3
C179,180	Ⓢ	ECEA1AS470	47
C181,182		ECUV1H471KM	470P
C183,184		ECUV1H103MBM	0.01
C185,186	Ⓢ	ECEA1AS470	47
C187,188	Ⓢ	ECQM1H683JZ	0.068
C189	Ⓢ	ECEA1AS101	100
C190	Ⓢ	ECEA0JS471	470
C191,192	⚠	ECEA1HN010S	1
C193	Ⓢ	ECKD1H103MD	0.01
C194	Ⓢ	ECEA16M6R8	6.8
C195	Ⓢ	ECEA0JS471	470
C196	Ⓢ	ECEA50Z1	1
C197		ECUV1H103MBM	0.01
C198,199		ECUV1H223MBM	0.022
C200,201	Ⓢ	ECEA1ES470	47

Ref. No.		Part No.	Value
CAPACITORS			
C202	Ⓢ	ECEA50Z1	1
C203	Ⓢ	ECEA1AS101	100
C204,205		ECUV1H223MBM	0.022
C206	Ⓢ	ECEA1CS100	10
C207,208	Ⓢ	ECEA1AS101	100
C209	⚠	ECEA1HN010S	1
C301,302	Ⓢ	ECEA1ES220	22
C303	Ⓢ	ECEA1ES220	22
C304	Ⓢ	ECCD1H470K	47P
C305	Ⓢ	ECEA50Z2R2	2.2
C306	Ⓢ	ECCD1H181K	180P
C307	Ⓢ	ECQM1H122JZ	0.0012
C308		ECCR1H561J	560P
C309	Ⓢ	ECCD1H101K	100P
C310	⚠	ECEA1HN010S	1
C311	Ⓢ	ECQM1H103JZ	0.01
C312	Ⓢ	ECQM1H332JZ	0.0033
C316,317	Ⓢ	ECEA50ZR22	0.22
C318	Ⓢ	ECEA1AS470	47
C319	Ⓢ	ECQM1H103JZ	0.01
C320	Ⓢ	ECCD1H101K	100P
C321	Ⓢ	ECEA25Z4R7	4.7
C322,323	Ⓢ	ECKD1H103MD	0.01
C324,325	Ⓢ	ECEA1AS101	100
C326,327	Ⓢ	ECKD1H103MD	0.01
C328,329	Ⓢ	ECKD1H103MD	0.01
C332	Ⓢ	ECEA1AS101	100
C333	Ⓢ	ECKD1H103MD	0.01
C335		ECQP1154JZ	0.15
C336		ECCR1H681J	680P
C337	Ⓢ	ECEA1CS330	33
C338	Ⓢ	ECEA1CS100	10
C401,402	⚠	ECEA1CN470S	47
C403,404		ECCR1H471J	470P
C405,406		ECQP1102GZ	0.001
C407,408	Ⓢ	ECCR1H471J	470P
C409,410	Ⓢ	ECKD1H152KB	0.0015
C411	⚠	ECEA0JN330S	33
C412,413	Ⓢ	ECEA0JS471	470
C414,415	Ⓢ	ECKD1H103MD	0.01
C416		ECUV1H223MBM	0.022
C417	Ⓢ	ECEA1AS470	47
C418		ECUV1H471KM	470P
C419,420	Ⓢ	ECCD1H100KC	10P
C421		ECQP1682GZ	0.0068
C422	⚠	ECEA1AN220S	22
C423	Ⓢ	ECEA50Z1	1
C424	Ⓢ	ECEA25Z4R7	4.7
C425	Ⓢ	ECEA50ZR47	0.47
C426,427		ECUV1H223MBM	0.022
C428	Ⓢ	ECEA0JS101	100
C429	Ⓢ	ECEA25Z4R7	4.7
C430		ECUV1H223MBM	0.022
C431	Ⓢ	ECEA0JS471	470
C432,433	Ⓢ	ECKD1H103MD	0.01
C434,435	Ⓢ	ECKD1H103MD	0.01
C436,437	Ⓢ	ECKD1H103MD	0.01
C438,439	Ⓢ	ECKD1H103MD	0.01
C440,441	Ⓢ	ECKD1H103MD	0.01
C442,443	Ⓢ	ECKD1H103MD	0.01
C444,445	Ⓢ	ECKD1H103MD	0.01
C446	Ⓢ	ECKD1H103MD	0.01
C447	Ⓢ	ECEA1HS100	10
C448	Ⓢ	ECEA1AS221	220
C449,450	Ⓢ	ECKD1H103MD	0.01
C451,452	Ⓢ	ECEA1ES101	100
C453,454	Ⓢ	ECKD1H103MD	0.01
C455,456	Ⓢ	ECEA1ES101	100
C457		ECEA0JU331	330
C458		ECUV1H101KM	100P
C481,482	Ⓢ	ECQM1H102JZ	0.001
C483	Ⓢ	ECQM1H103JZ	0.01
C484	Ⓢ	ECEA50Z3R3	3.3
C485	Ⓢ	ECKD1H103MD	0.01
C486	Ⓢ	ECEA1AS470	47
C487	Ⓢ	ECQM1H272JZ	0.0027
C490	⚠	ECEA1CN100	10
C491A		ECUV1H680KM	68P
C491B	Ⓢ	ECEA50Z1	1

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Ref. No.	Part No.	Value
CAPACITORS		
C492,493	ECQP1122FZ	0.0012
C494 Ⓢ	ECKD1H103MD	0.01
C495	ECEA0JU471	470
C496,497	ECKF1E104ZV	0.1
C498	ECKF1E104ZV	0.1
C499	ECEA0JU471	470
C500	ECKF1E104ZV	0.1
C501,502 Ⓢ	ECQM1H102JZ	0.001
C503,504 Ⓢ	ECQM1H102JZ	0.001
C505 Ⓢ	ECQM1H103JZ	0.01
C506 Ⓢ	ECEB1HSR47	0.47
C507	ECQP1102GZ	0.001
C508 Ⓢ	ECQM1H102JZ	0.001
C509 Ⓢ	ECEB2AS010	1
C510 Ⓢ	ECQM1H102JZ	0.001

Ref. No.	Part No.	Value
CAPACITORS		
C511 Ⓢ	ECQM1H103JZ	0.01
C512 Ⓢ	ECEB1CS101	100
C513,514 Ⓢ	ECEB50ZR22	0.22
C516	ECCF1H331J	330P
C517,518 ⚠	ECEA1AN330S	33
C519,520 Ⓢ	ECEB1VS4R7	4.7
C521 Ⓢ	ECKD1H103MD	0.01
C522 Ⓢ	ECEA1AS101	100
C523,524 Ⓢ	ECKD1H103MD	0.01
C525,526 Ⓢ	ECKD1H103MD	0.01
C527,528 Ⓢ	ECEB1AS470	47
C529	ECCF1H101J	100P
C530 Ⓢ	ECKD1H103MD	0.01
C601,602 Ⓢ	ECEA50Z1	1
C603,604 Ⓢ	ECQM1H102JZ	0.001

Ref. No.	Part No.	Value
CAPACITORS		
C605,606 Ⓢ	ECEA50M3R3R	3.3
C607 Ⓢ	ECEA50Z1	1
C608 Ⓢ	ECEA1HS100	10
C609 Ⓢ	ECEA1ES101	100
C611 Ⓢ	ECQM1H223JZ	0.022
C612 ⚠	ECEA1CN100S	10
C613,614 Ⓢ	ECEA50ZR47	0.47
C615 Ⓢ	ECQM1H472JZ	0.0047
C616 Ⓢ	ECEA1HS100	10
C617,618	ECUV1H102MBM	0.001
C619 Ⓢ	ECEA1ES101	100
C620	ECUV1H103MBM	0.01
C621 Ⓢ	ECEA1ES470	47

● AC Power unit

Ref. No.	Part No.	Value
CAPACITORS		
C701 ⚠Ⓢ	ECQM1H683JZ	0.068
C702	ECES1VV472S	4700
C703 Ⓢ	ECCD1H101K	100P
C705 Ⓢ	ECCD1H680K	68P
C706 Ⓢ	ECEA50Z3R3	3.3
C707 Ⓢ	ECEA1ES101	100
C708,709 Ⓢ	ECEA50Z4R7	4.7

■ HOW TO REPLACE CHIPS (Resistor, Capacitor and Jumper)

1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in **Fig. 20.**
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in **Fig. 21**.

Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

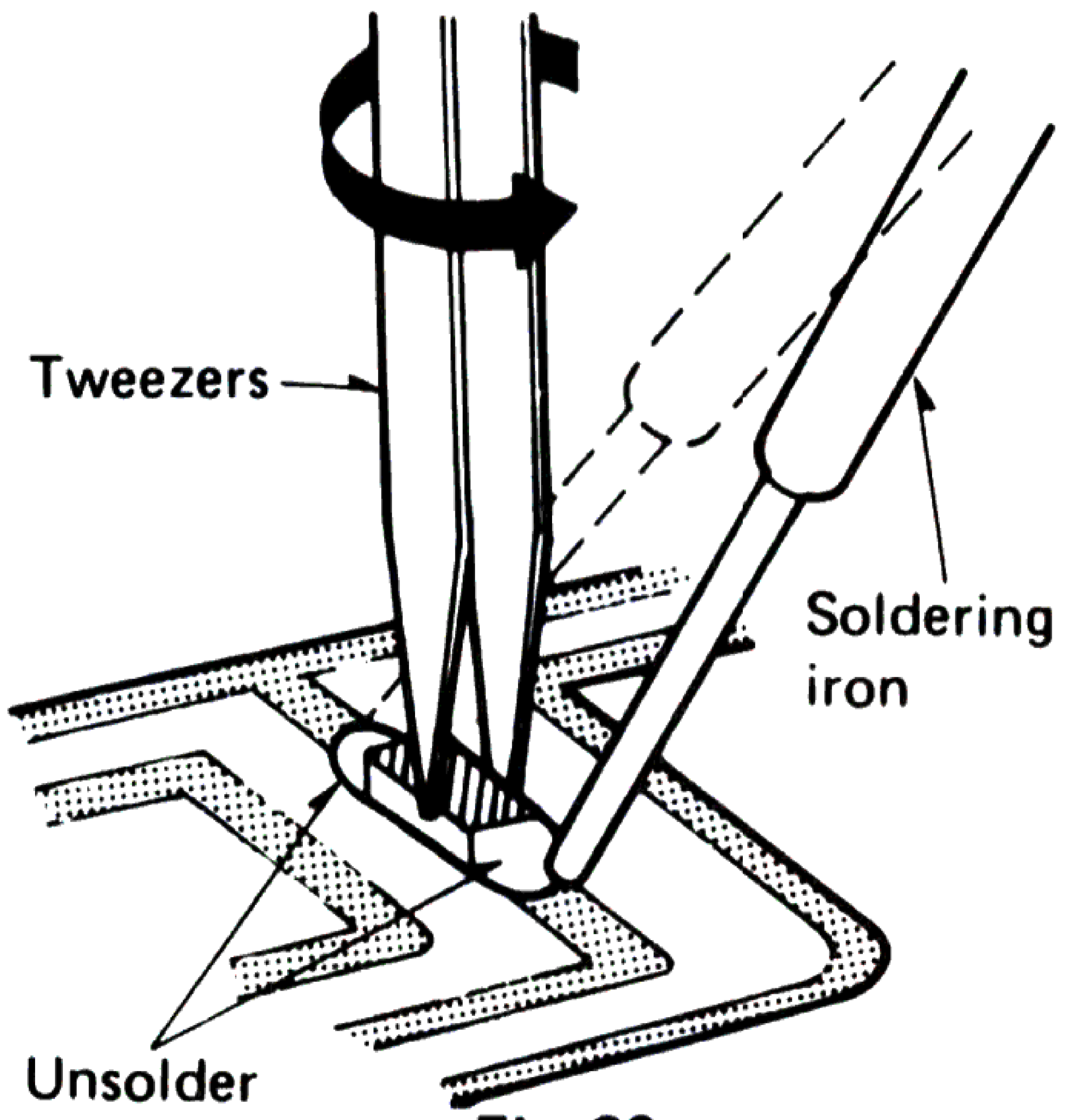

Fig. 20

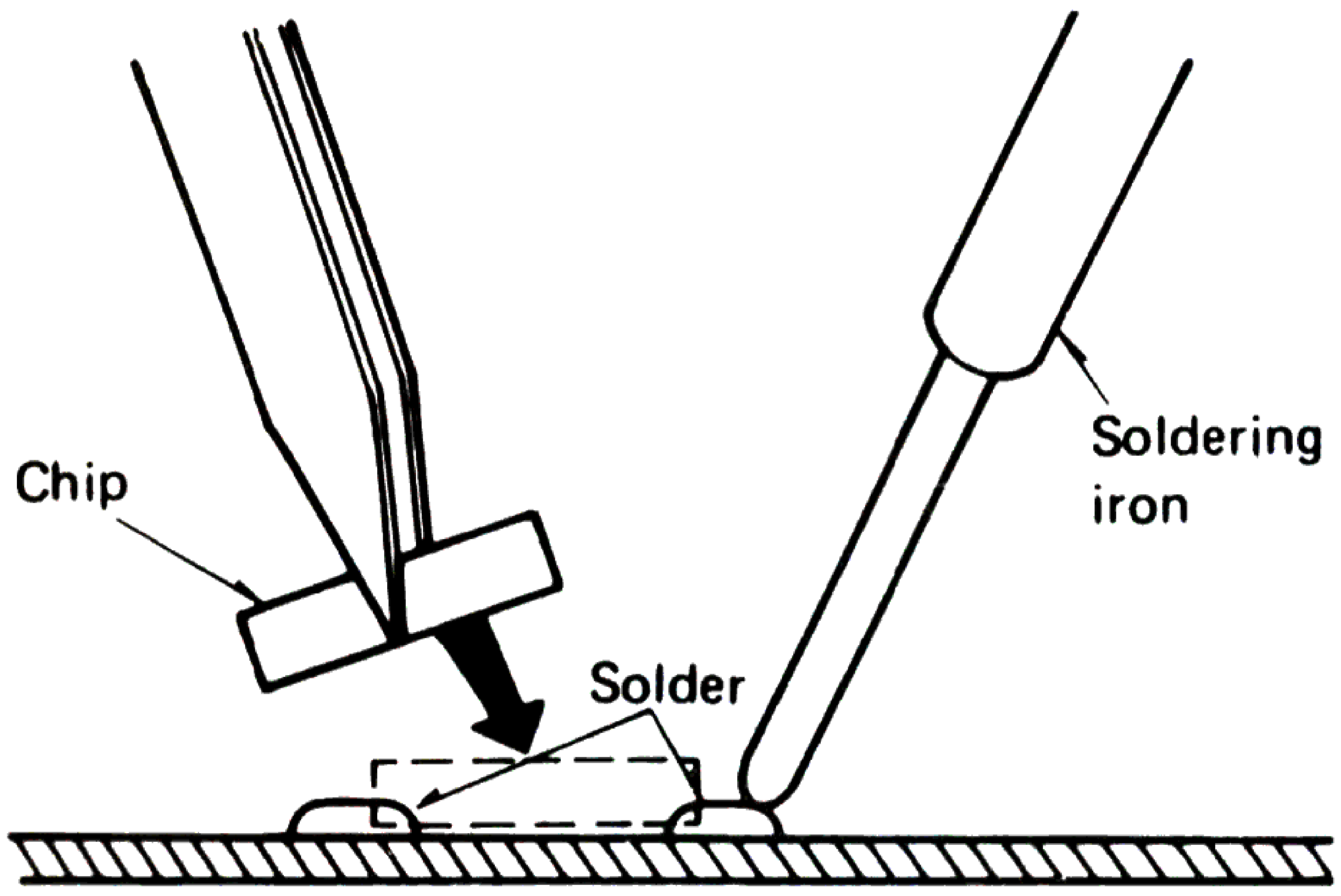

Fig. 21

● Note for replacing chips

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60 W) and tweezers for replacing chips.

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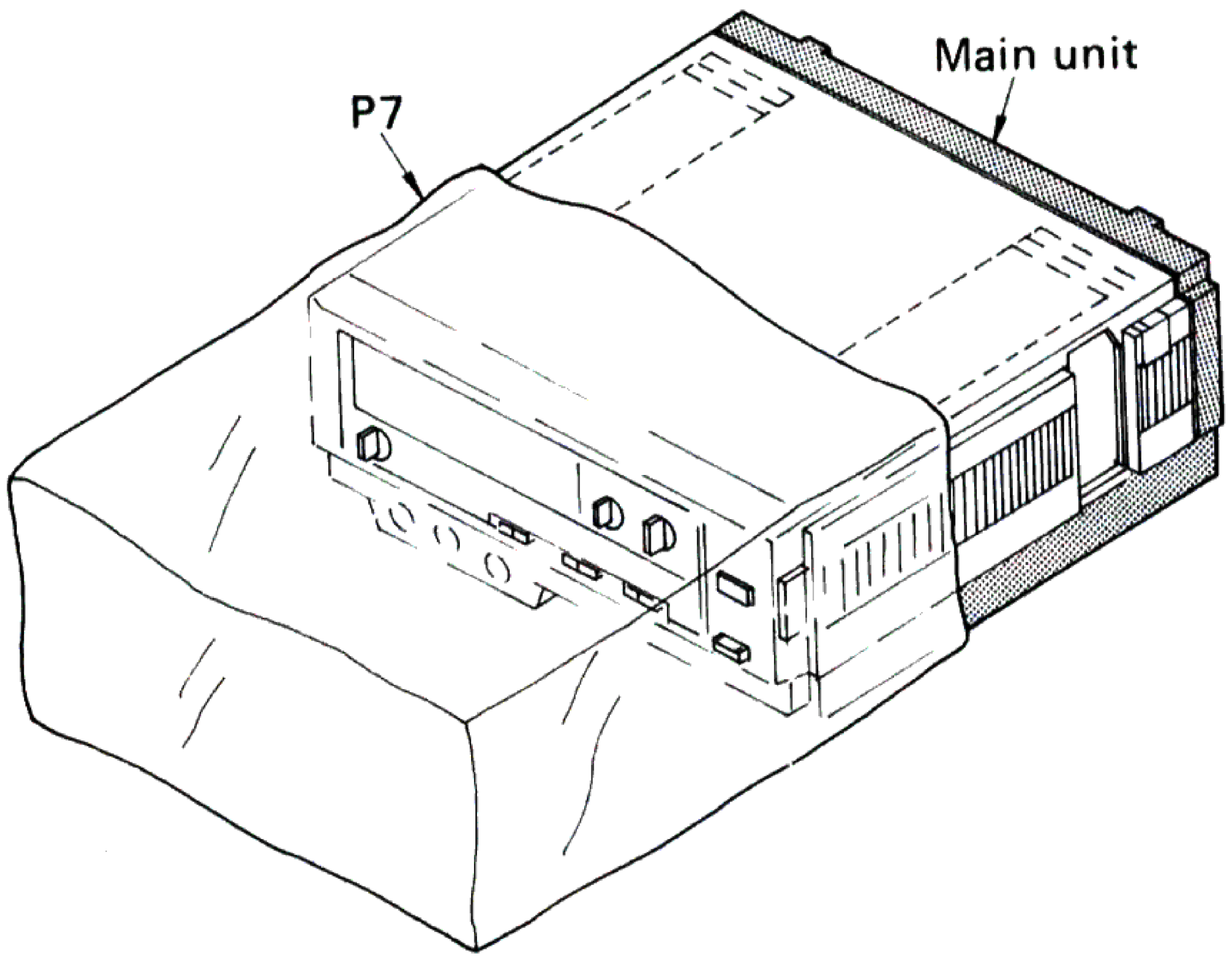
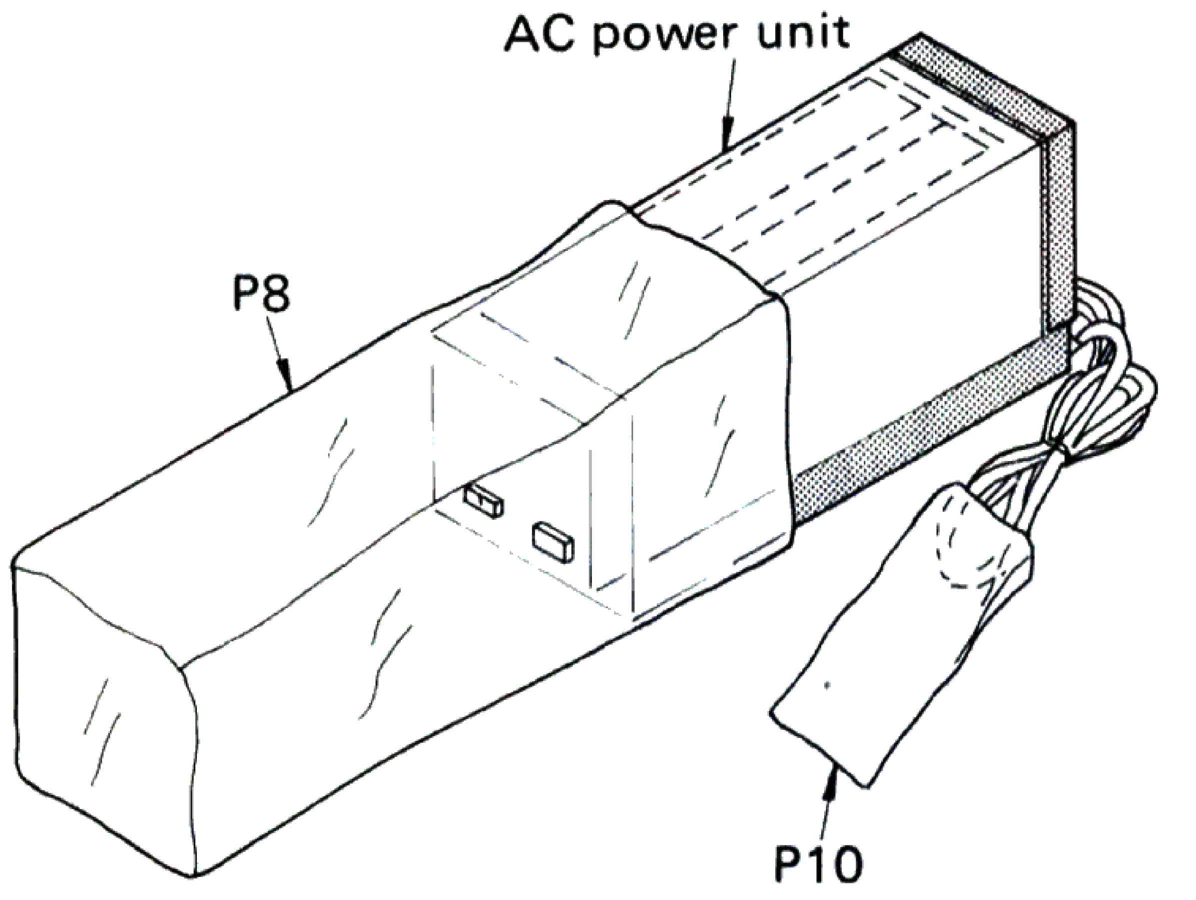
■ PACKING

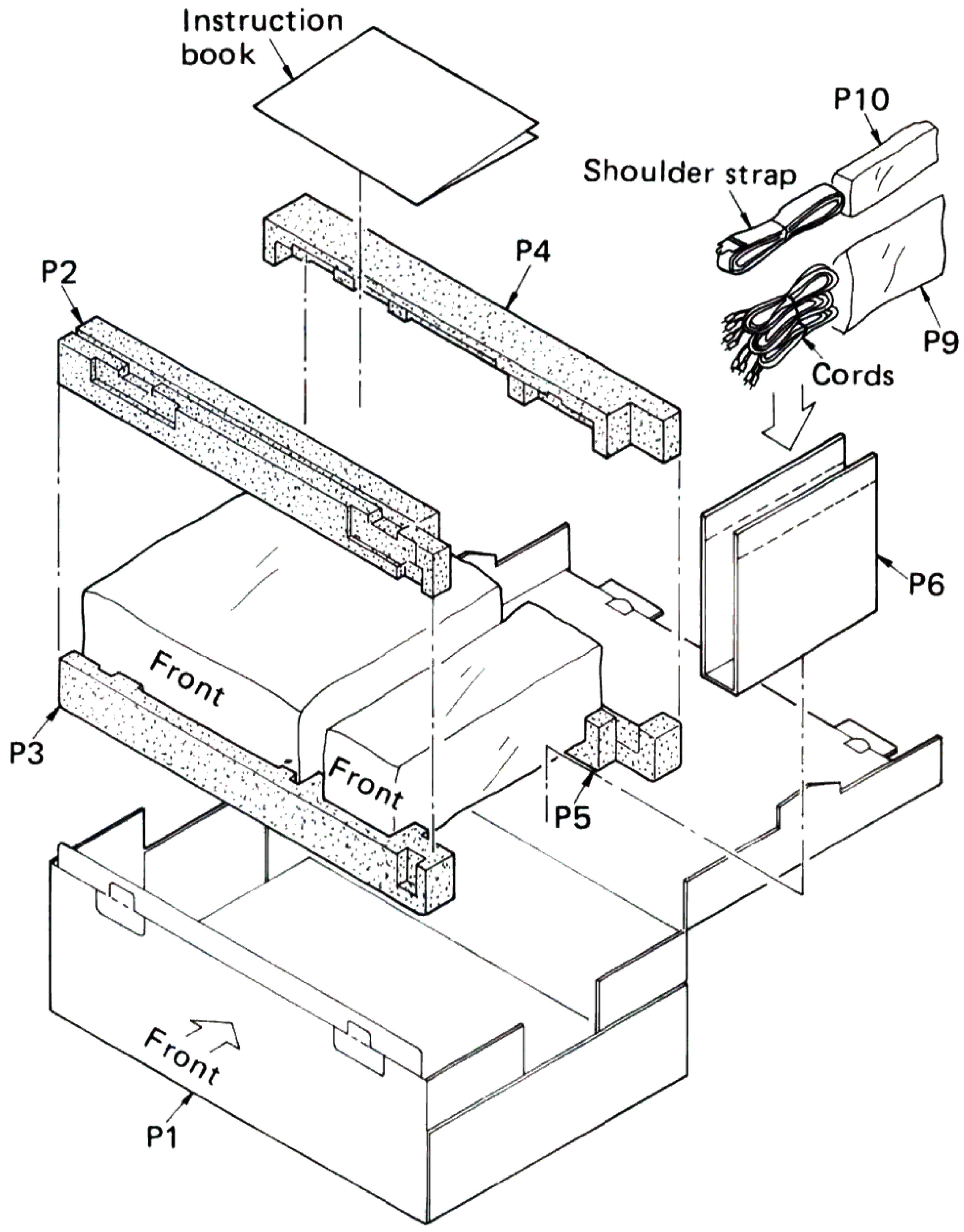
1. Put the main unit into polyethylene bag, and tape its opening.



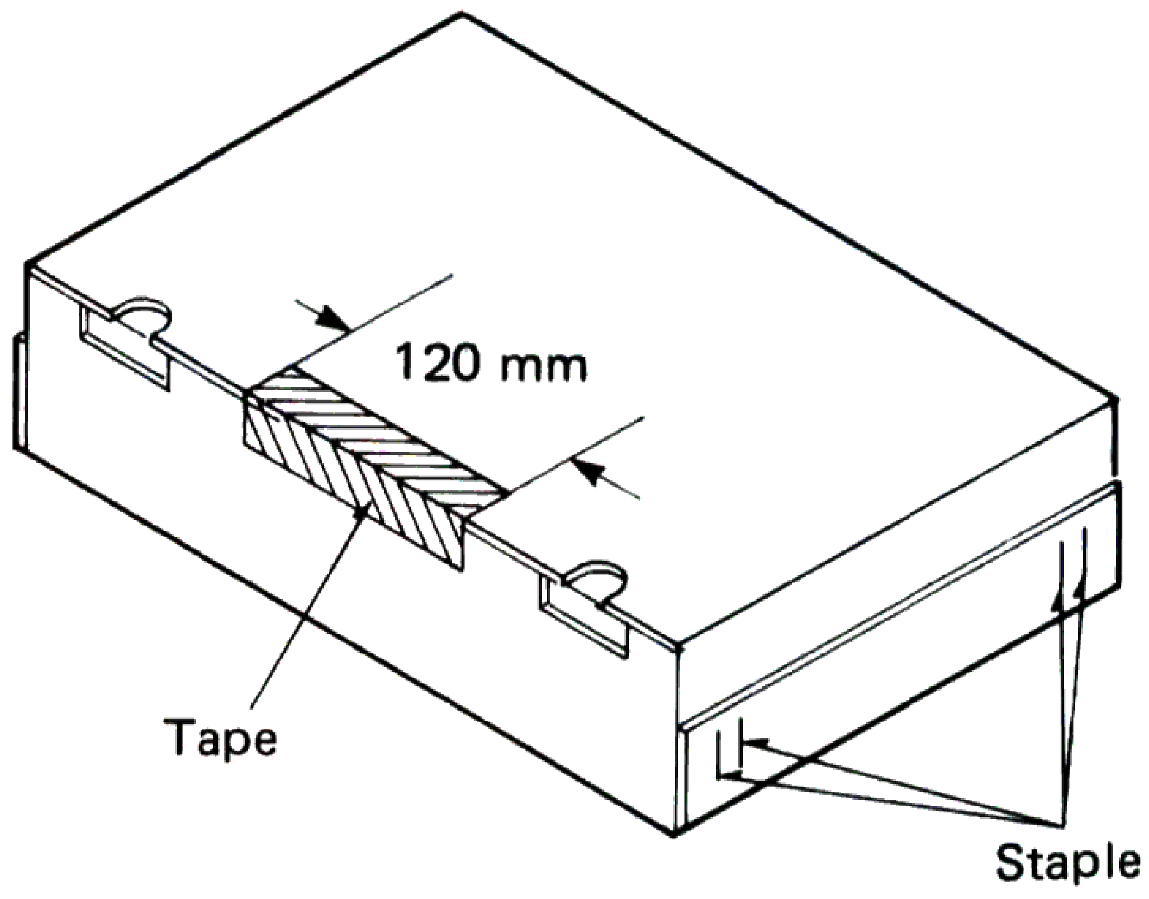
2. Put the cord of AC power unit into polyethylene bag, and the unit into bag.



3. Package in following procedure.

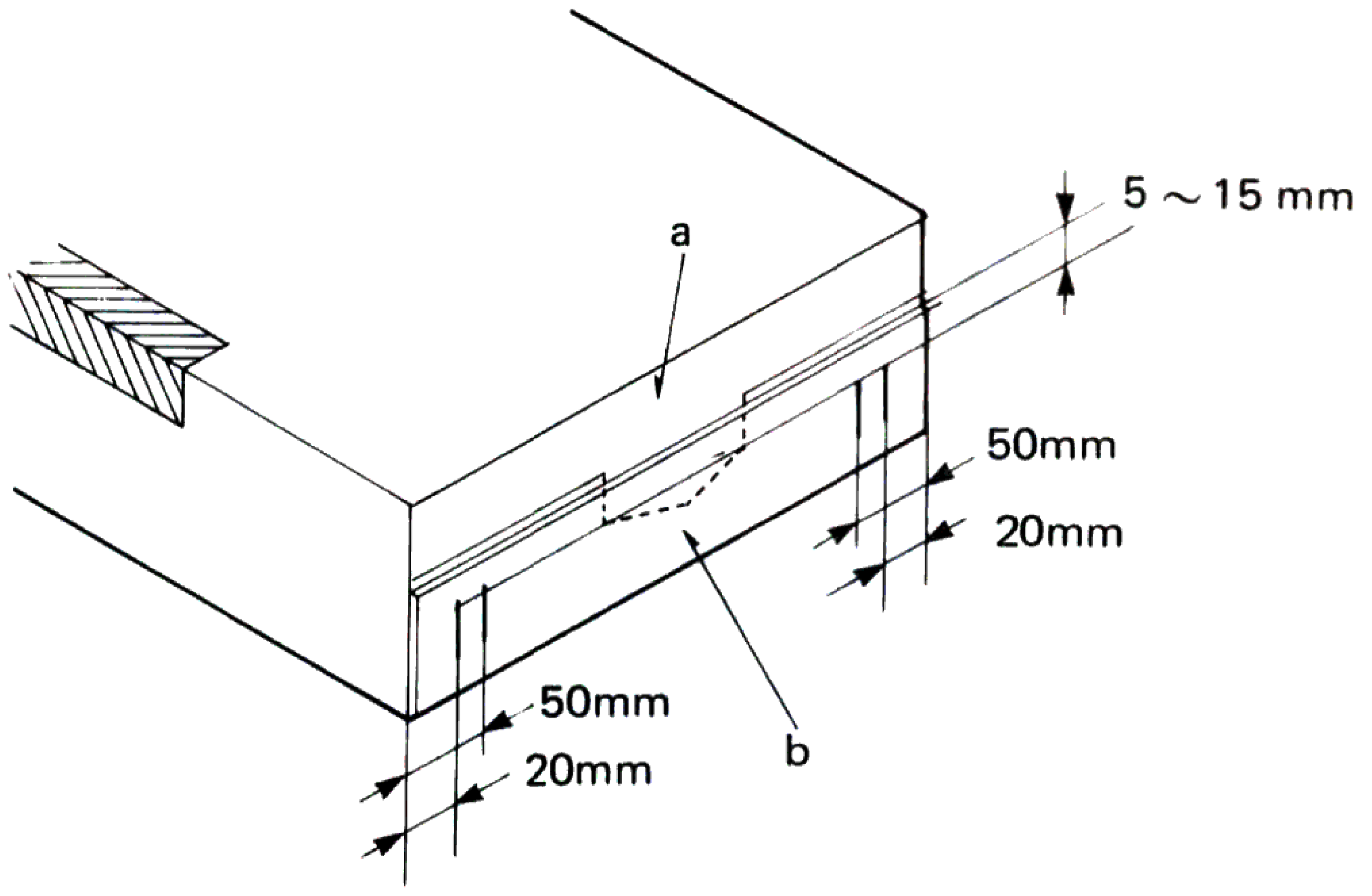


4. Seal the top with adhesive tape.
   * Use gum tape or adhesive cloth tape of 50 mm wide at least.



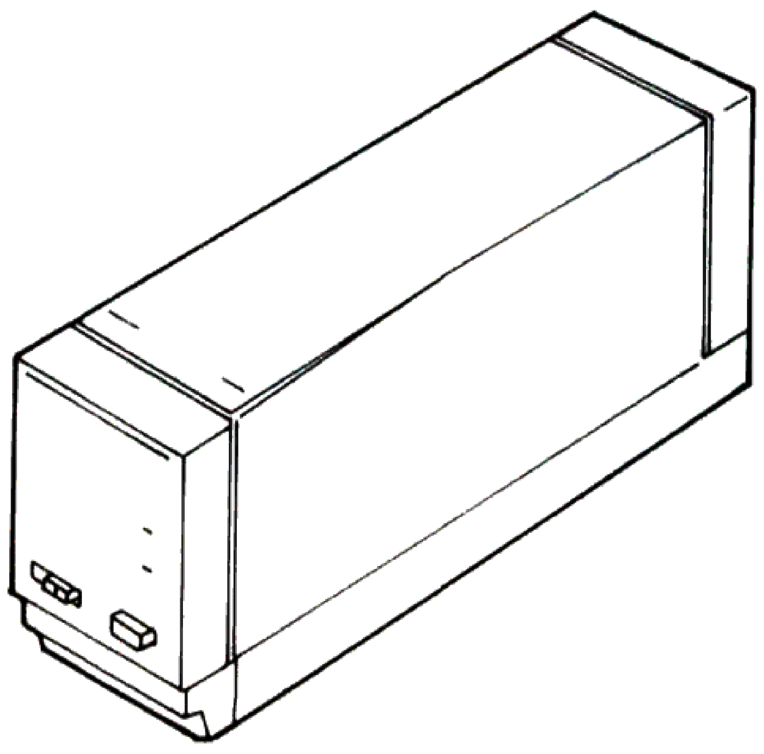
5. For the edges, first fold the flap "a" and then flap "b" and staple. Remember to staple only flap "b". (Use 15 or 16 mm staple)

   * Stapling positions are shown below.

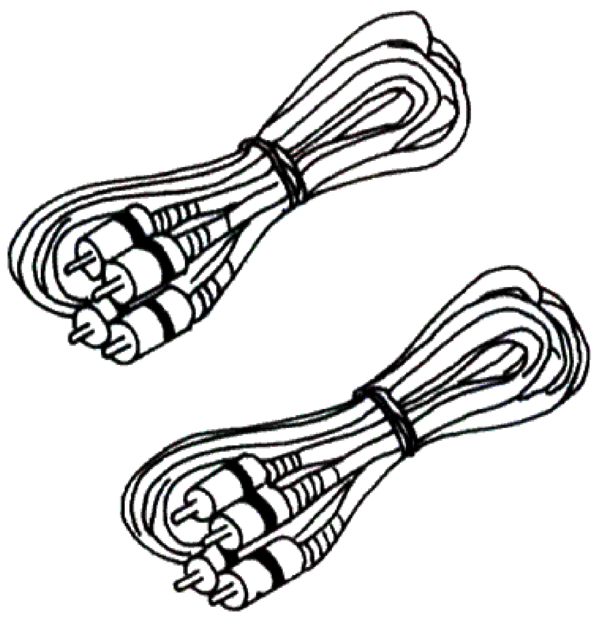


• Accessories

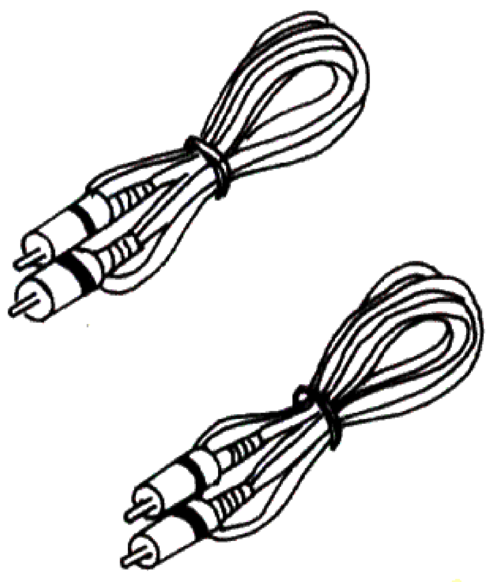
AC power unit (SH-V100)



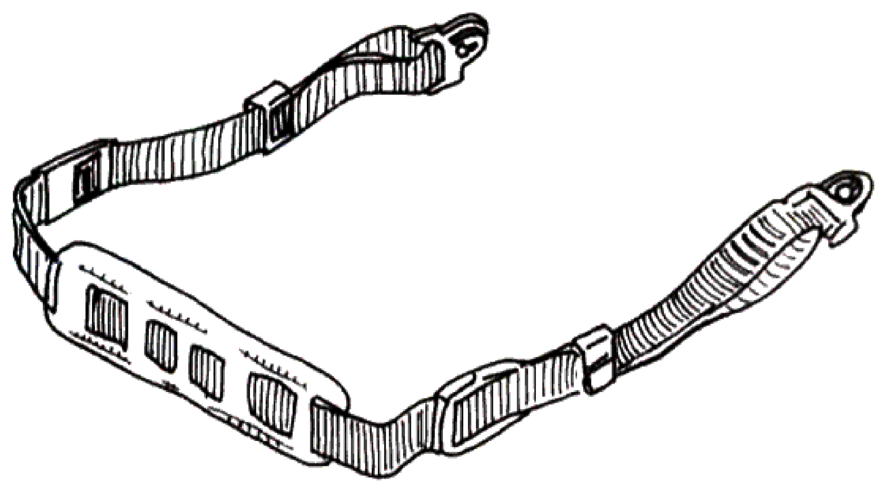
Line cord x 2



Video cords x 2



Shoulder strap



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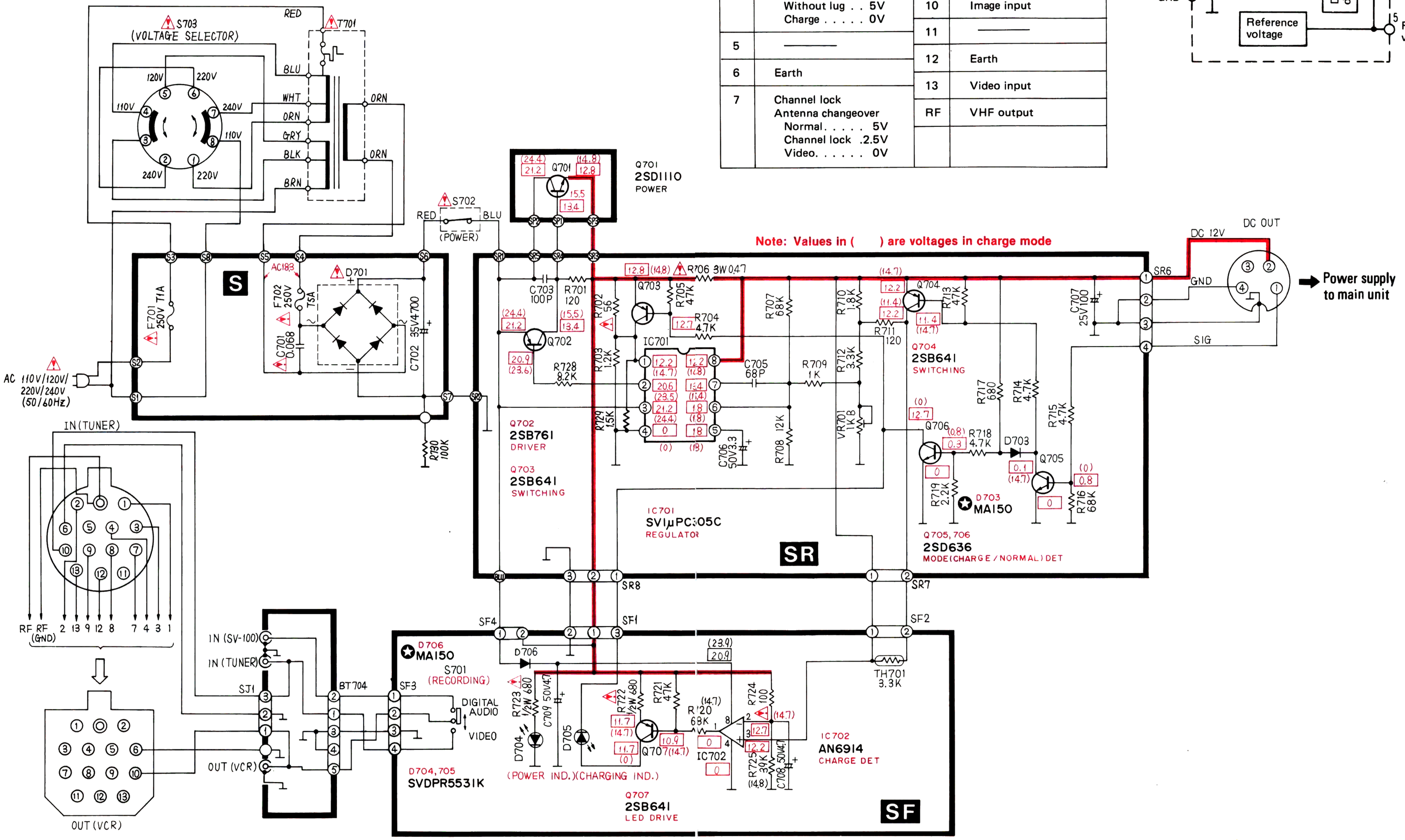
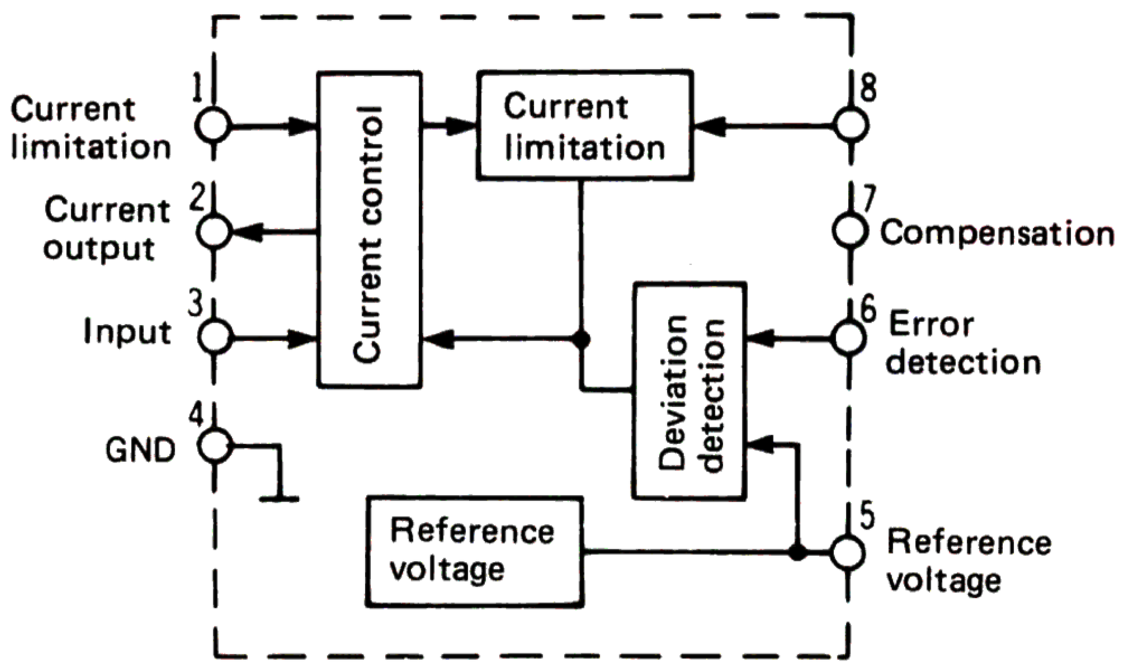
• AC power unit (SH-V100)



• Multi-terminal arrengement and signal

No.	Signal	No.	Signal
1	Heater	8	Serial lock II
2	Power supply (12V)		[Pulse amplitude 5V]
3	Earth	9	Serial signal
4	Lug break charge control With lug . . . .12V Without lug . . 5V Charge 0V		[Pulse amplitude 5V]
		10	Image input
		11	————
5	————	12	Earth
6	Earth	13	Video input
7	Channel lock Antenna changeover Normal. . . . . 5V Channel lock .2.5V Video. 0V	RF	VHF output

• Block diagram of IC701 (SVIμPC305C)



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

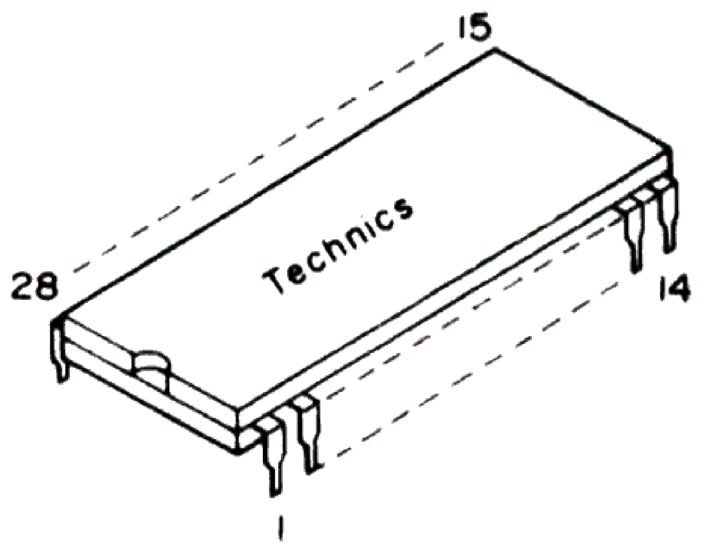
* Part No. with ✪ mark are not identical between regular part No. and repair part No. supplied.
  So, when placing an order for repair parts, use that part No. in the replacement parts list of repair parts.
* For the wire connection in the schematic diagram, refer to "CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM" (P38).

Notes:

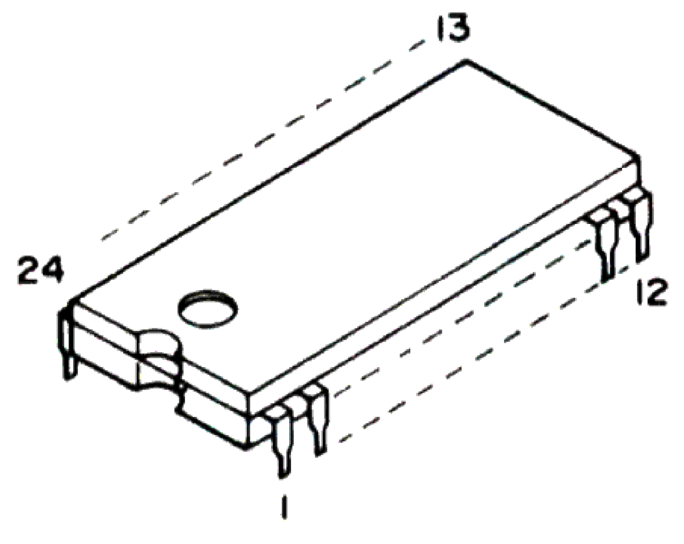
1. **S601** : Power switch in "**on**" position.
2. **S602** : Recording muting switch in "**off**" position.
3. **S603** : Indicator switch in "**level**" position.
   level ←→ tracking/batt
4. **S604** : Playback mode switch in "**1**" position.
   1 ←→ 2
5. **S605** : Playback muting switch in "**auto**" position.
   auto ←→ off
6. **S701** : Recording mode switch in "**digital audio**" position. (AC power unit)
   digital audio ←→ video
7. **S702** : Power switch in "**on**" position. (AC power unit)
8. **S703** : Voltage selector switch in "**110V**" position.
   110V ←→ 120V ←→ 220V ←→ 240V
9. The written voltage and waveform are the reference voltage and waveform in playback mode which are measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of earth line. Accordingly, the voltage value may include some error depending upon the internal impedance of DC electronic voltmeter (tester, etc.) and the set measured.
10. Playback signal lines / Recording signal lines / Mic signal lines / Positive (+B) voltage lines
11. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety.
    When replacing any of these components, use only manufacturer's specified parts.

■ TERMINAL GUIDE OF IC'S , TRANSISTORS AND DIODES

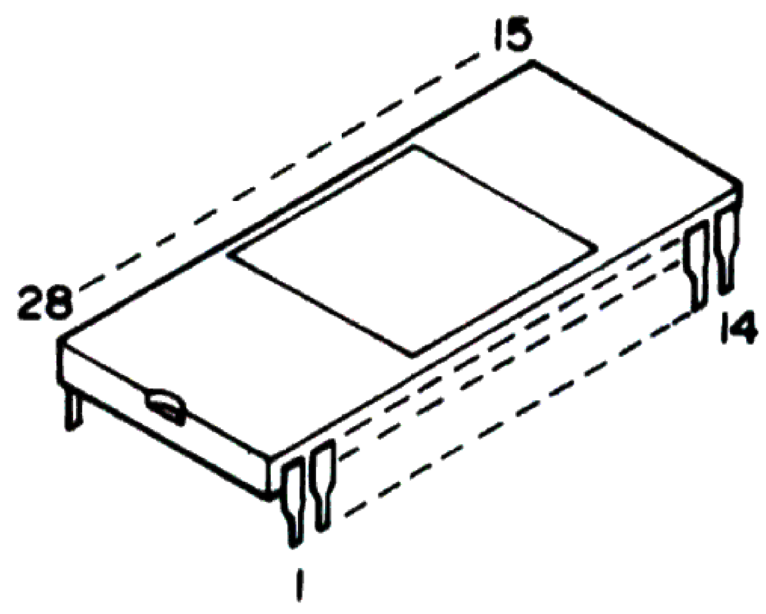
MN1400PCA



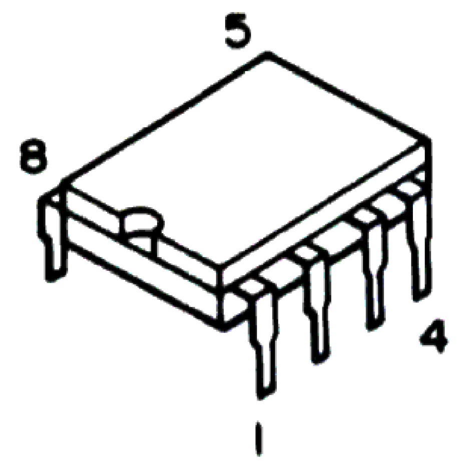
SVIHM6116P-4



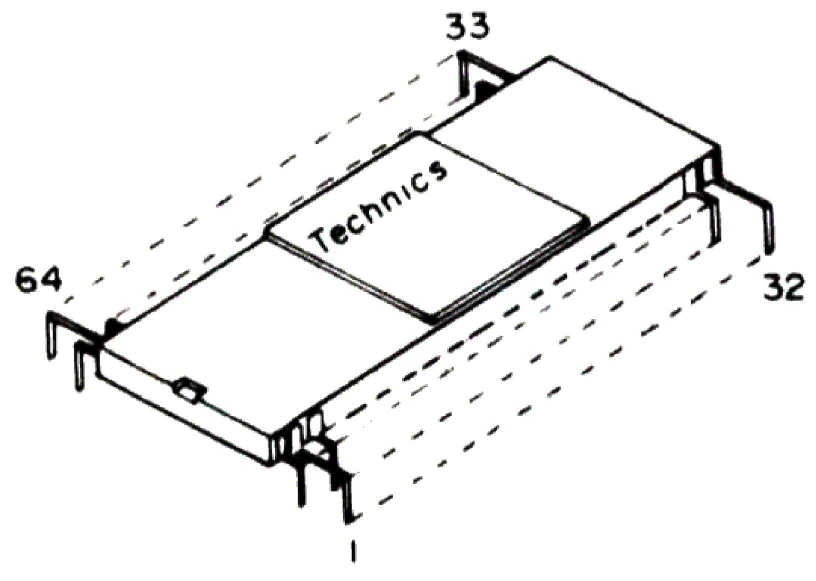
MN6603



AN6552, SVIUPC305C
AN6562
AN6914



MN6601
MN6602



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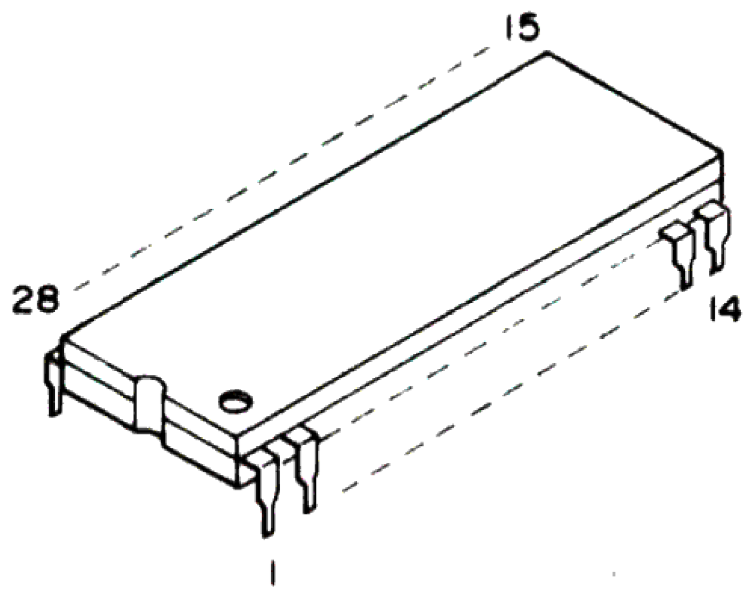
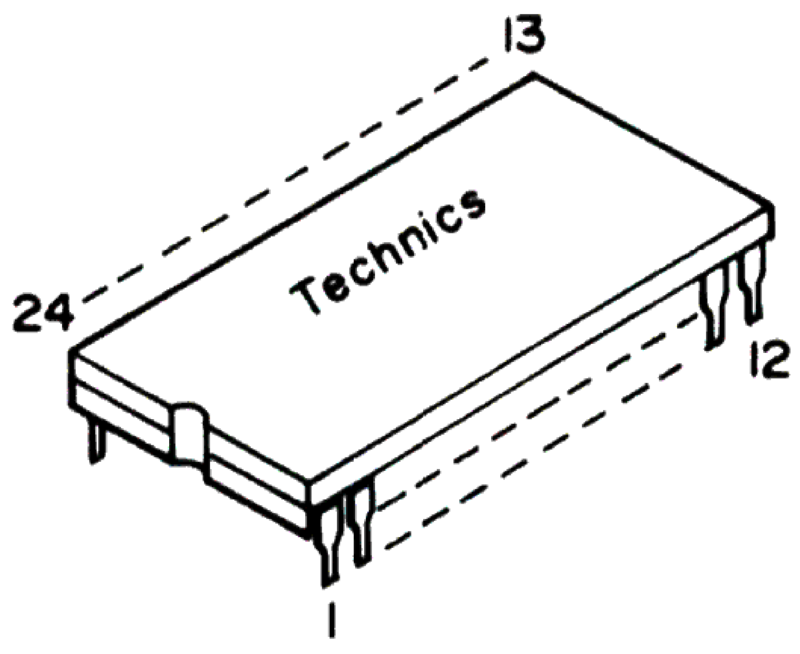


EHKMA6196



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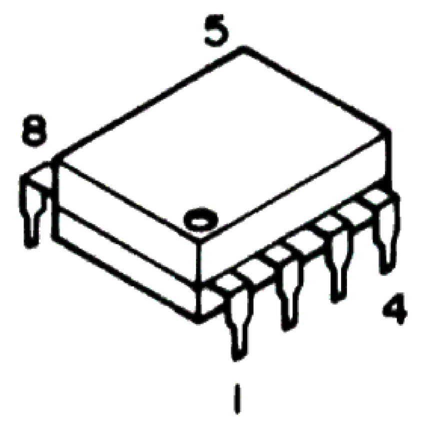
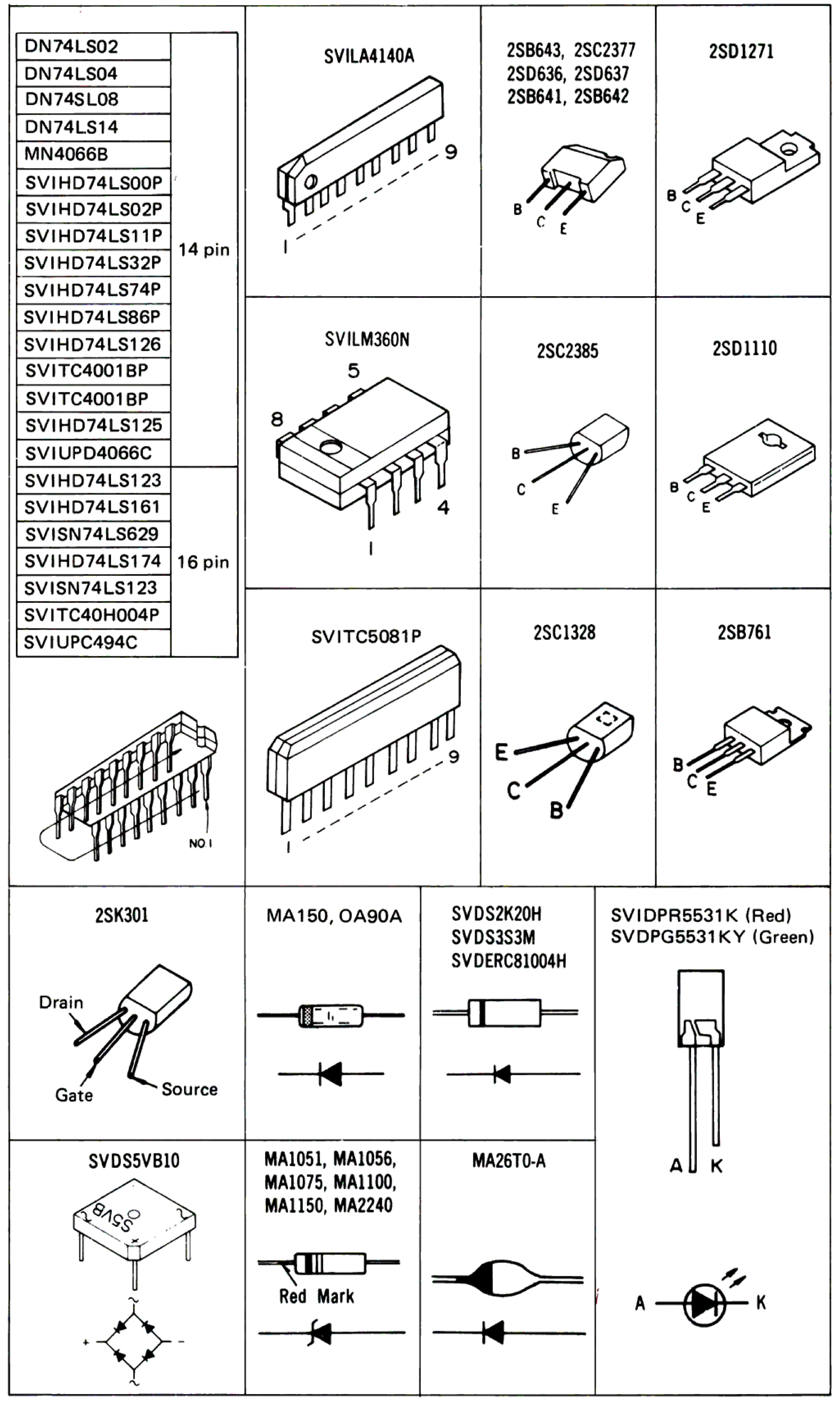
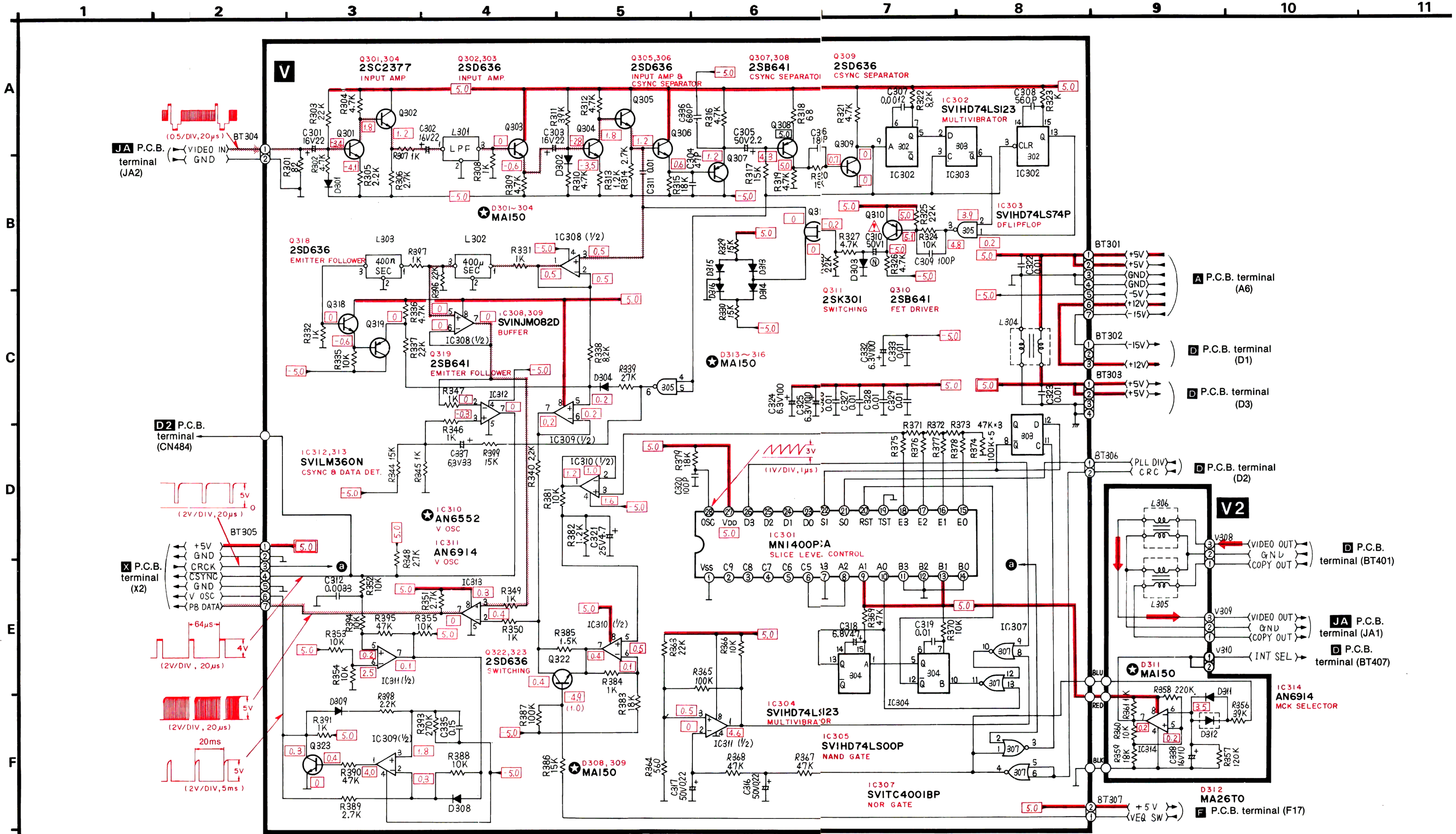
SVINJM4559DS
SVITL081CP
SVITL082CP





• Video circuit



Note: Value in ( ) are voltage with playback mode selector (S604) set to "2".

• **Synchronizing circuit**

• **Analog circuit**

● Display circuit

Note: Values in [ ] are voltages with indicator selector (S603) set to "tracking/batt."

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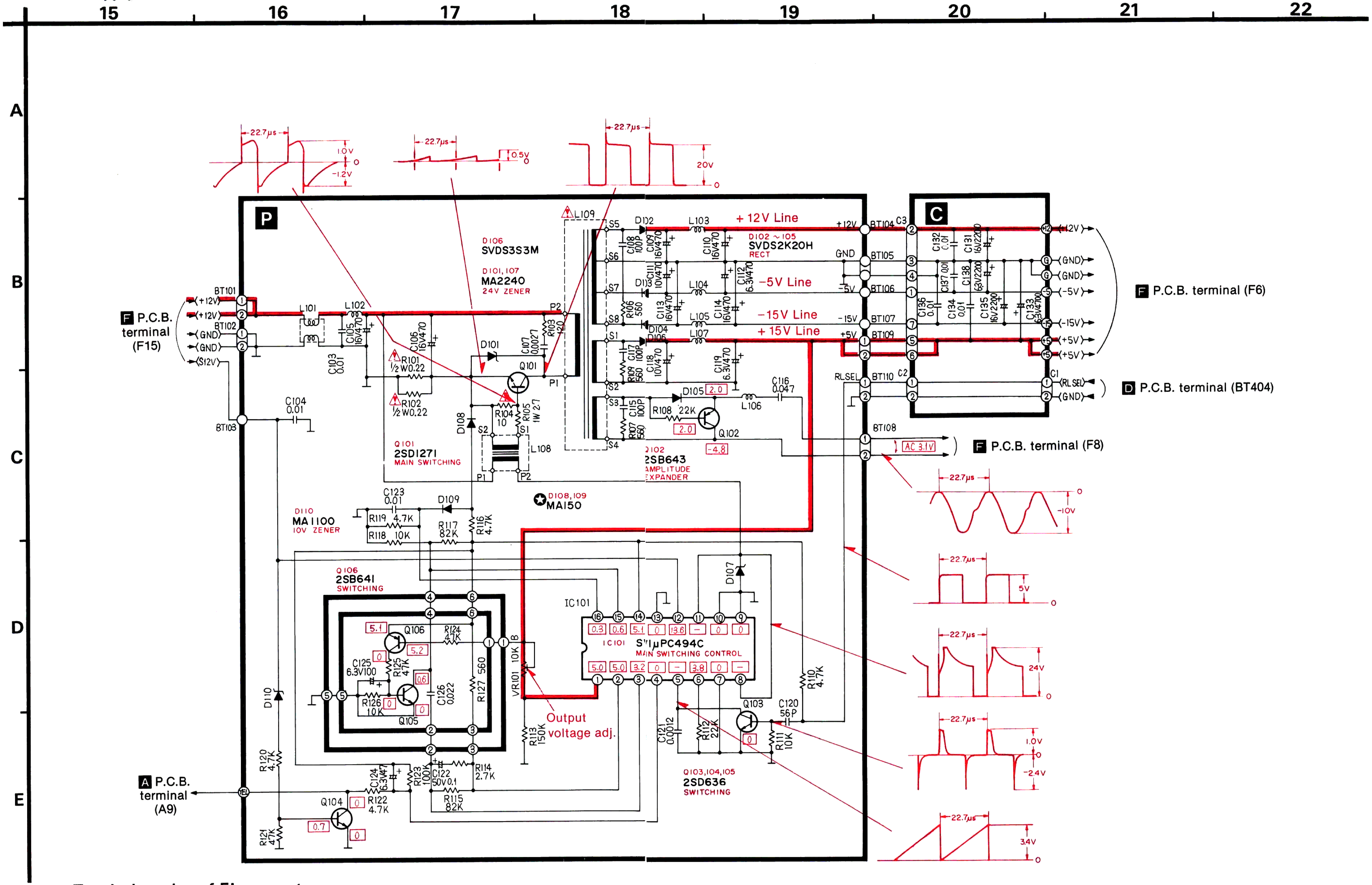
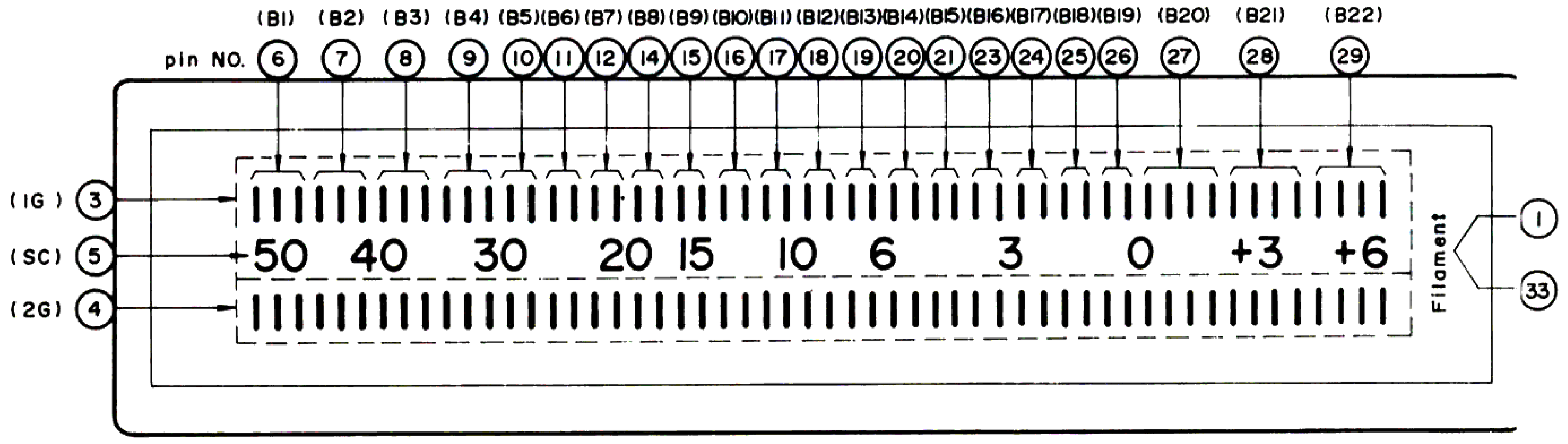
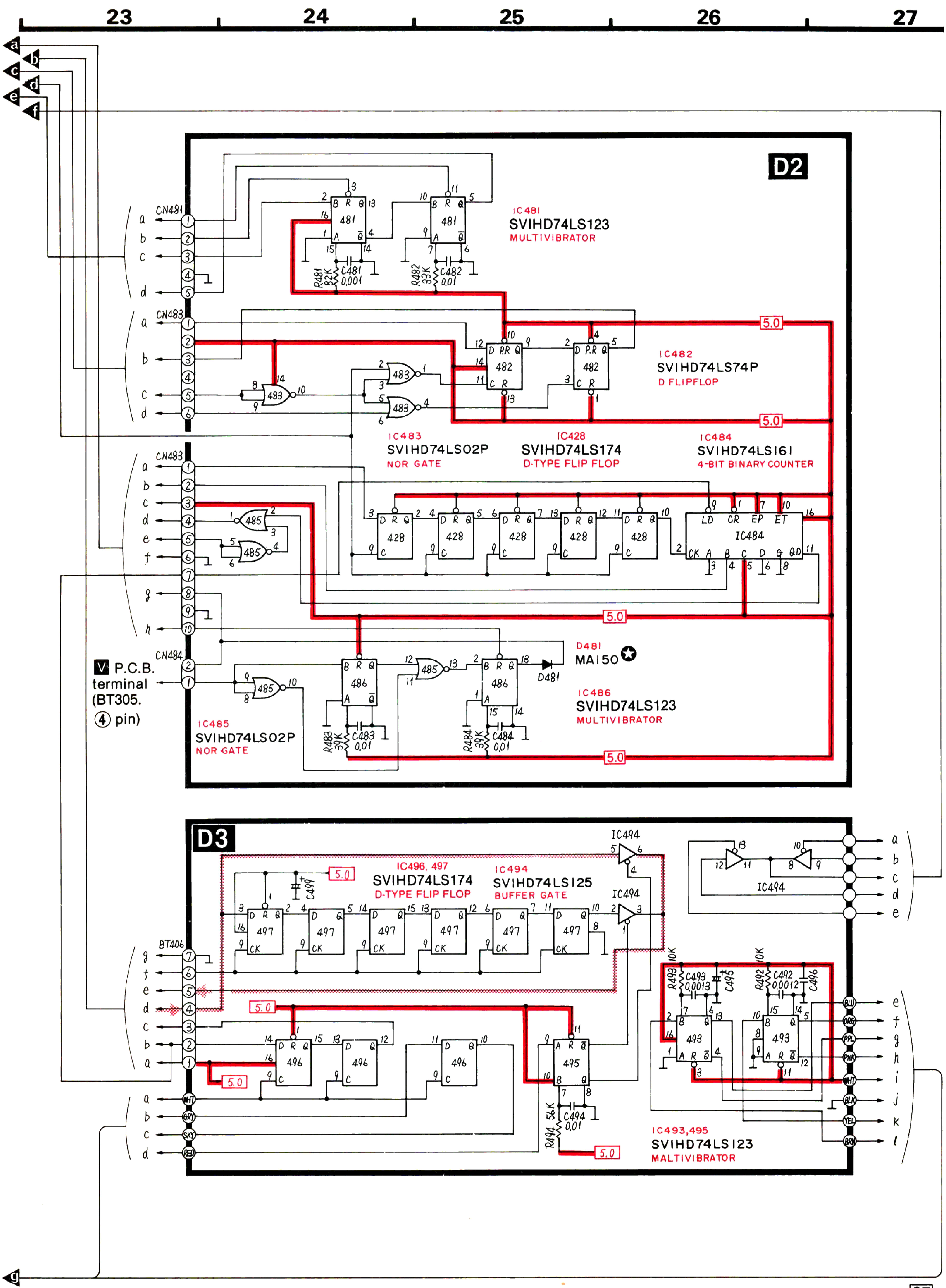
- **Power supply circuit (DC-DC converter)**



- **Terminal number of FL segment**



• **Digital circuit**



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